The PHOTOFACT Servicer

SET 453 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ AUGUST 1959

CONTENTS PHOTOFACT SET 453

TRADE NAME AND MODEL	SET AND FOLDER NO.
TELEVISION RECEIVERS	
RCA VICTOR	
Chassis KCS124C, D, E, F, H, J, K, L	453-1
TRAV-LER	
821-FT-900, U, 821-K-909, U, 821-K-910, U, 821-T-901, U, 821-T-905, U, 921-K-910, U, 921-T-901, U (Ch. 1051-19)	453-2
OTHER EQUIPMENT	
AIRLINE	
WG-2673A, WG-2674A, WG-3503A, B	453-3
BELL SOUND	
2521	453-4
COLUMBIA	
360	453-5
DUAL Record Changer	
1004	453-6
EXCEL	
XL-45	453-7
Mc INTOSH	
MR-55	453-8
MOTOROLA	
S14B, CW, M, W, SK13B, M, MC, SK14B, CW, M, W (Ch. HS-696, HS-709)	453-9
OLYMPIC	
688	453-10
REGENCY	
RP-3, TR-22	453-11
SHARP	
TR-182	453-12
WESTINGHOUSE	
H-43AC1, H-43AC2	453-13
H-46AC1, 2, 3 (Ch. V-2503-3)	453-14
ZENITH	
SF2560, E, R, SF2565M, SF2570, Y, SF2575R, SF2580H (Ch. 7B31, 8B24, 9B25)	453-15

This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

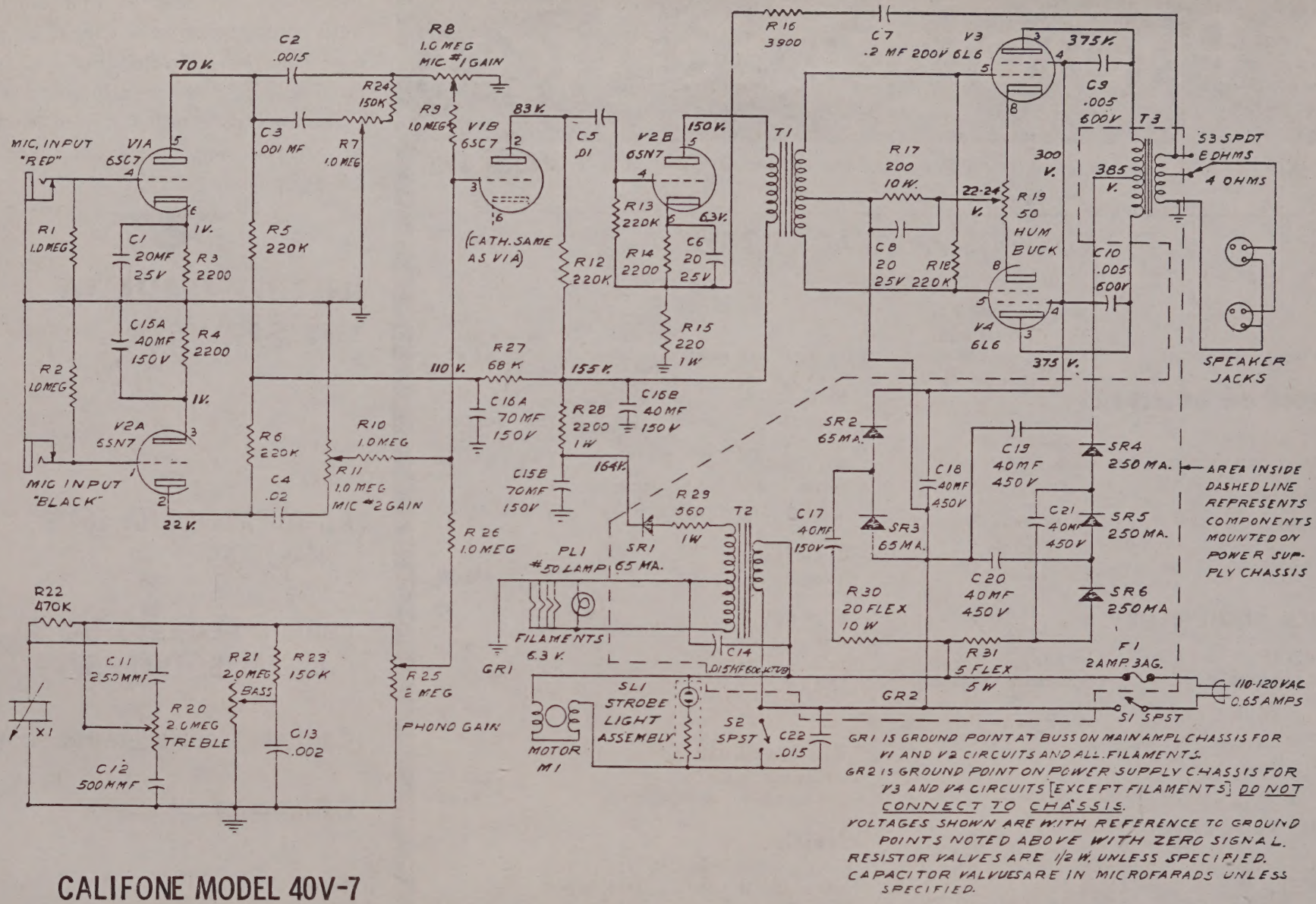
IN THIS ISSUE OF THE SERVICER:

Airline Models HA-1645A, HA-1646A

Califone Models 5J-7A, B, 6U-7A, B, 7V-7, B

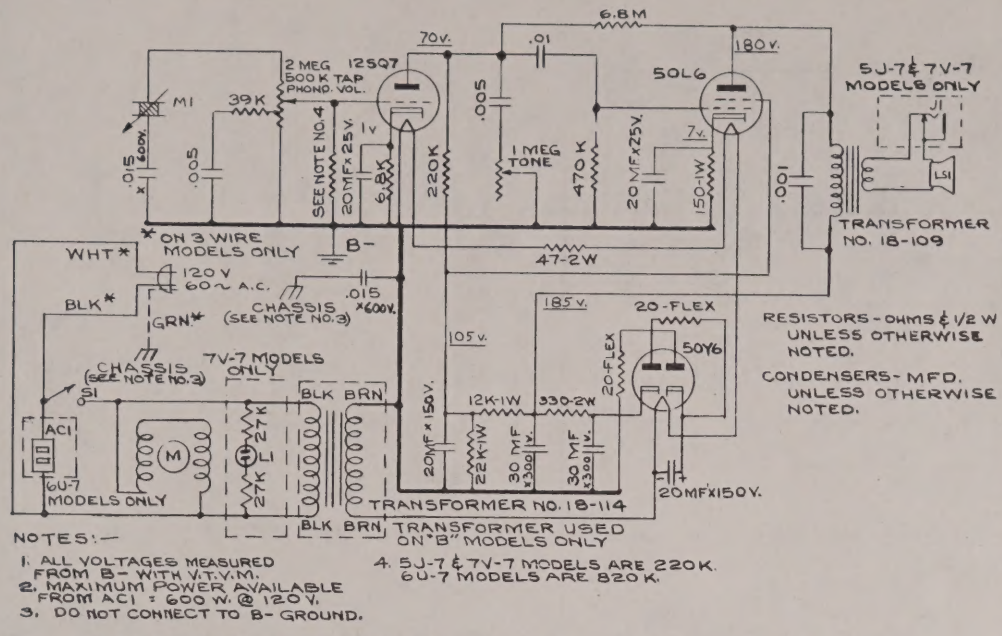
Califone Models 12MH8, 12MV

Califone Model 40V-7



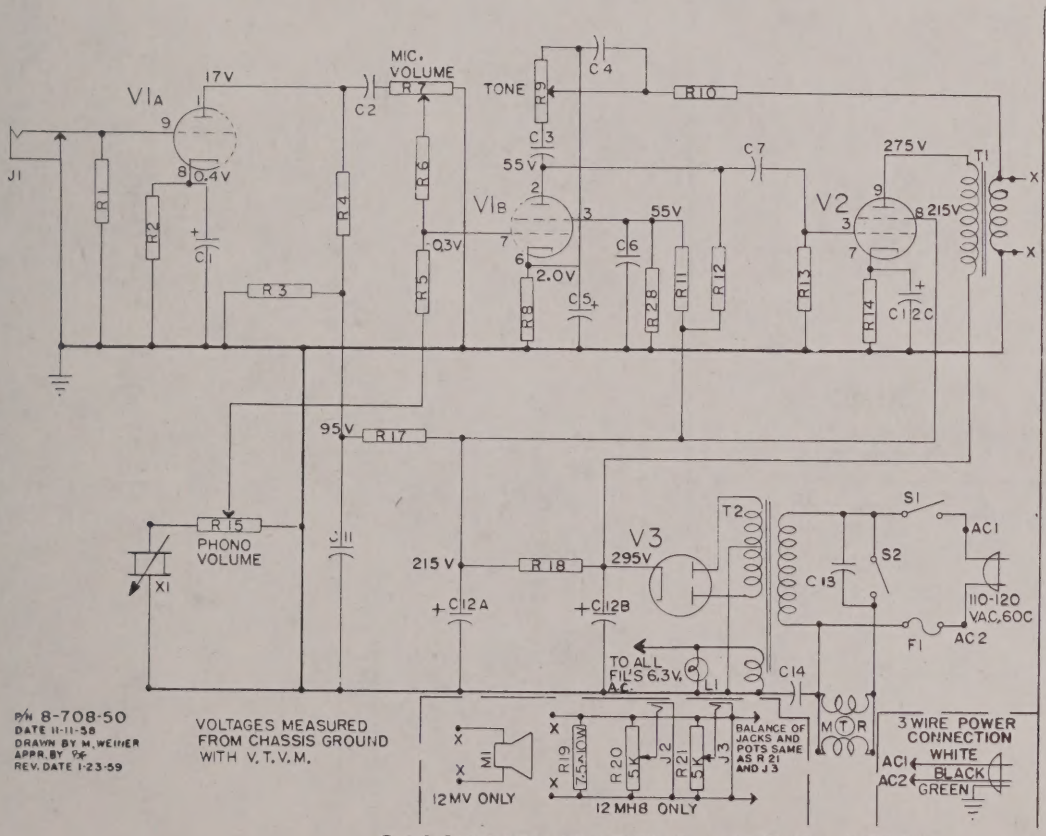
CALIFONE MODEL 40V-7

Schematic Diagram Courtesy of Califone Corp.



CALIFONE MODELS 5J-7A, B, 6U-7A, B, 7V-7, B

Schematic Diagram Courtesy of Califone Corp.



RESISTORS (IN OHMS 1/2 WATT UNLESS OTHERWISE NOTED.)

R-1	1 MEG
R-2	620
R-3	100K
R-4	100K
R-5	470K
R-6	470K
R-7	1 MEG OHM POT. 13-901
R-8	2200
R-9	1 MEG OHM POT. 13-901
R-10	3.9K
R-11	68K 1W
R-12	220K
R-13	470K
R-14	165 2W
R-15	2 MEG OHM POT. 13-922
R-17	68K
R-18	12K 1W
R-19	7.5 OHM 10W (12MH8 ONLY)
R-20 to 27	5K OHM POT.
R-28	27K

CONDENSERS

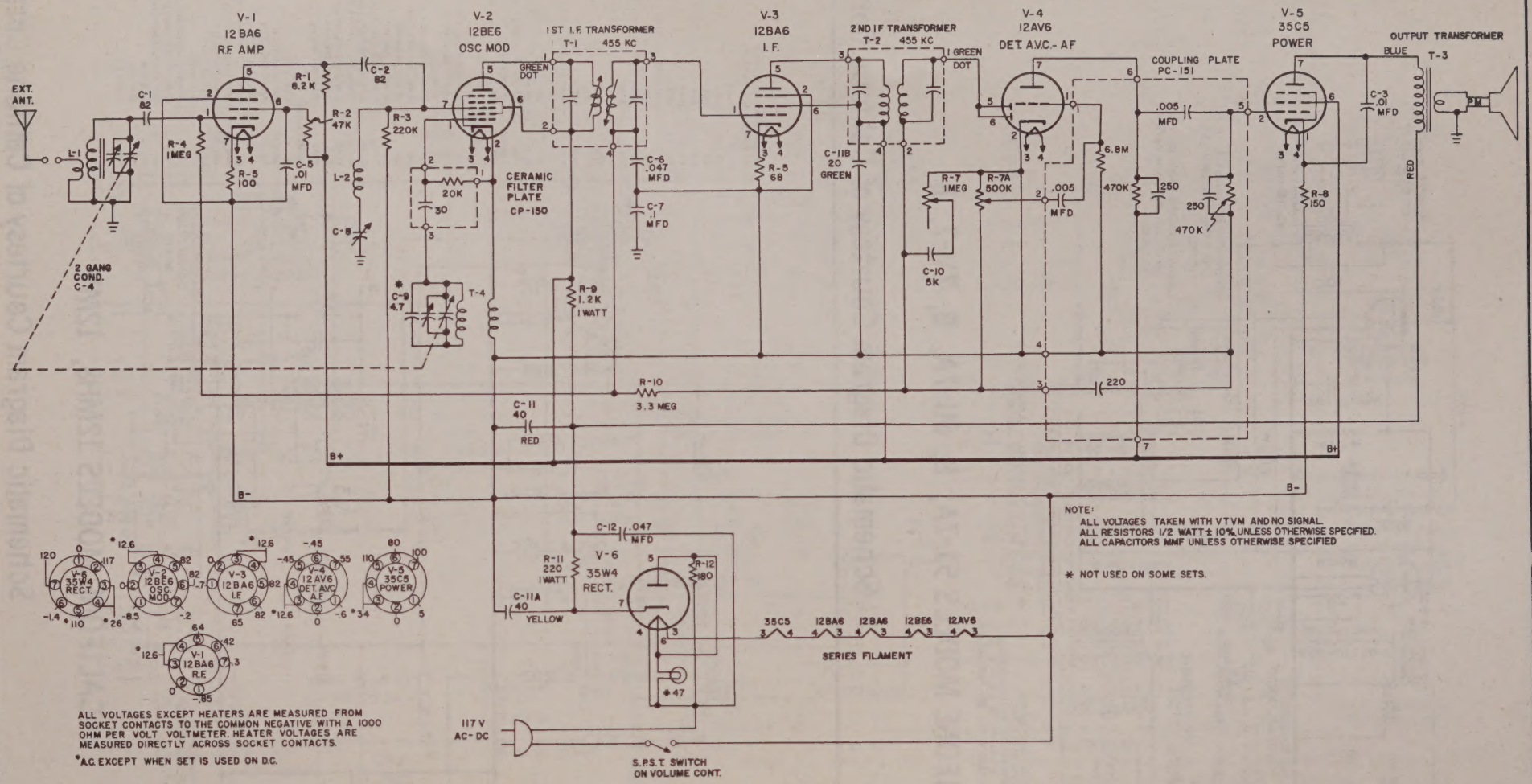
C-1	20 MFD. 25V. ELECTRO.
C-2	.05 MFD. TUBULAR
C-3	750 MMFD.
C-4	.05 MFD. TUBULAR
C-5	20 MFD. 25V. ELECTRO
C-6	.05 MFD. TUBULAR
C-7	.05 MFD. TUBULAR
C-11	40 MFD. 150V. ELECTRO.
C-12A	20 MFD. 450V. FILTER CAN
C-12B	20 MFD. 450 V. FILTER CAN
C-12C	20 MFD. 25V. FILTER CAN
C-13	.015 MFD. TUBULAR
C-14	.015 MFD. TUBULAR

MISCELLANEOUS

J-1	JACK
J-2 to J-9	AUX JACKS 29-7260
F-1	FUSE 2 AMP. 3 AG
L-1	DIAL LAMP GE 12
M-1	SPEAKER (12 MV ONLY) 20-21
	MTR. DRIVE MOTOR (12MH8 ONLY) 30-104
	MTR. DRIVE MOTOR (12 MV ONLY) 30-106
S-1	SPST SWITCH
S-2	SPST SWITCH
T-1	OUTPUT TRANSFORMER 18-111
T-2	POWER TRANSFORMER 18-102
X-1	CARTRIDGE, CERAMIC 7-35-50
V-1	TUBE 7199
V-2	TUBE 6973
V-3	TUBE 6 X 5

CALIFONE MODELS 12MH8, 12MV

Schematic Diagram Courtesy of Califone Corp.



NOTE:
ALL VOLTAGES TAKEN WITH VTVM AND NO SIGNAL.
ALL RESISTORS 1/2 WATT ± 10% UNLESS OTHERWISE SPECIFIED.
ALL CAPACITORS MMF UNLESS OTHERWISE SPECIFIED

* NOT USED ON SOME SETS.

ALL VOLTAGES EXCEPT HEATERS ARE MEASURED FROM SOCKET CONTACTS TO THE COMMON NEGATIVE WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES ARE MEASURED DIRECTLY ACROSS SOCKET CONTACTS.

*A.C. EXCEPT WHEN SET IS USED ON D.C.

AIRLINE MODELS HA-1645A, HA-1646A

Schematic Diagram Courtesy of Montgomery Ward & Co.

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

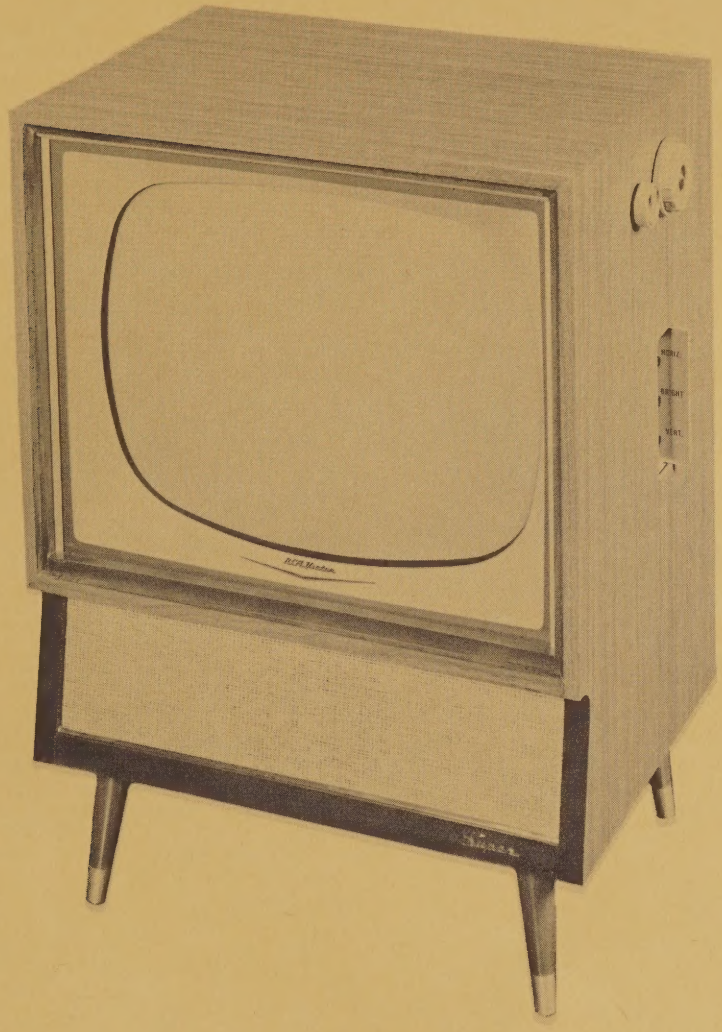
RCA VICTOR CHASSIS KCS124C, D, E, F, H, J, K, L

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

RCA VICTOR CHASSIS KCS124C, D, E, F, H, J, K, L



MODEL 21T9266 (Ch. KCS124C)

RCA VICTOR CHASSIS KCS124C, D, E, F, H, J, K, L

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

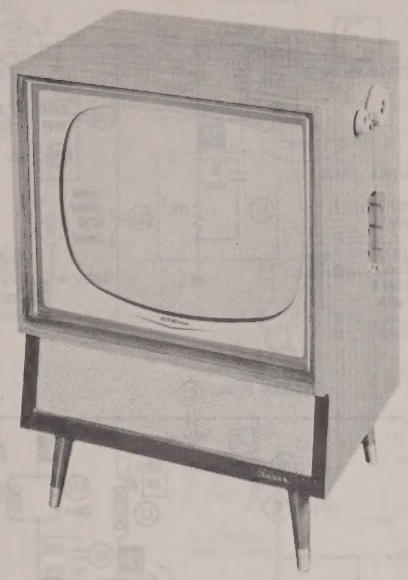
RCA VICTOR CHASSIS KCS124C, D, E, F, H, J, K, L

RCA VICTOR CHASSIS KCS124C, D, E, F, H, J, K, L

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 21T9266

1. Remove 8 wood screws holding rear cover. Remove antenna connection. Remove rear cover.
2. Remove 7 push-on type knobs from side of cabinet.
3. Remove 2 metal screws holding side control panel. Remove control panel.
4. Remove speaker leads, picture tube socket, yoke plug, and HV lead.
5. Remove 4 nuts and 2 chassis bolts holding chassis.
6. Remove chassis.



MODEL 21T9266 (Ch. KCS124C)

TRADE NAME	RCA Victor	MODELS	CHASSIS
		21T9265, 21T9266, 21T9267	KCS124C
		21T9265U, 21T9266U, 21T9267U	KCS124D
		21T9345, 21T9346, 21T9347	KCS124E
		21T9345U, 21T9346U, 21T9347U	KCS124F
		21T9122, 21T9125, 21T9127	KCS124H
		21T9122U, 21T9125U, 21T9127U	KCS124J
		21T9275, 21T9276, 21T9277	KCS124K
		21T9275U, 21T9276U, 21T9277U	KCS124L

MANUFACTURER	Radio Corporation of America, RCA Victor Tele. Div., Camden 8, N.J.
TYPE SET	Television Receiver
TUBES	VHF-Eighteen, UHF-Nineteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 190 Watts, 1.8 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 5 screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE

Three fuse wires are used for filament protection. (For location, see M1, M2, M3 in photo "Chassis Bottom View".

FUSE DEVICE

A 9Ω fusible resistor (R103) is used for horizontal sweep circuit protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Stabilizing slug. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Width coil. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive trimmer. (For location, see "Tube Placement Chart".)

CENTERING

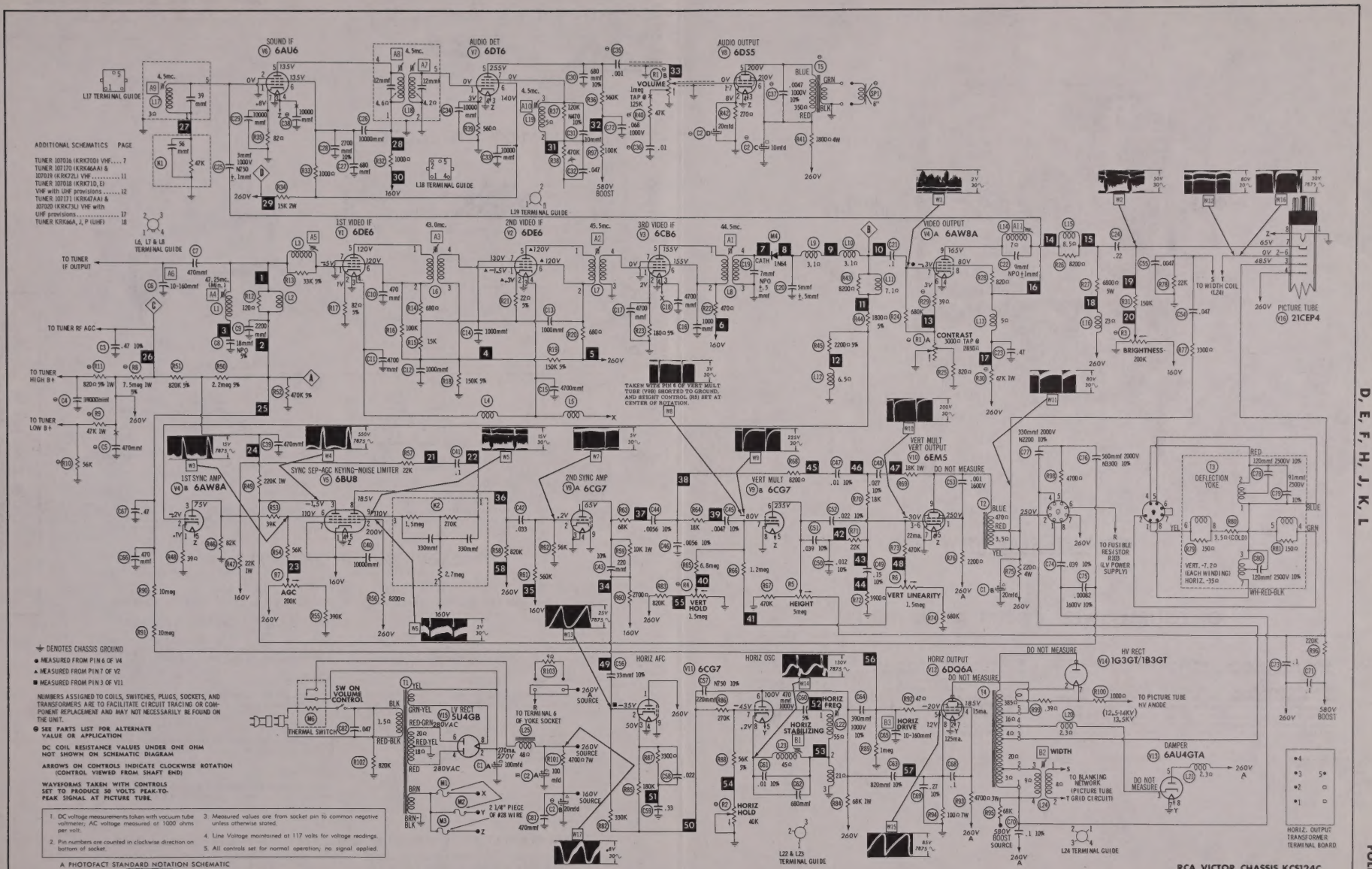
Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

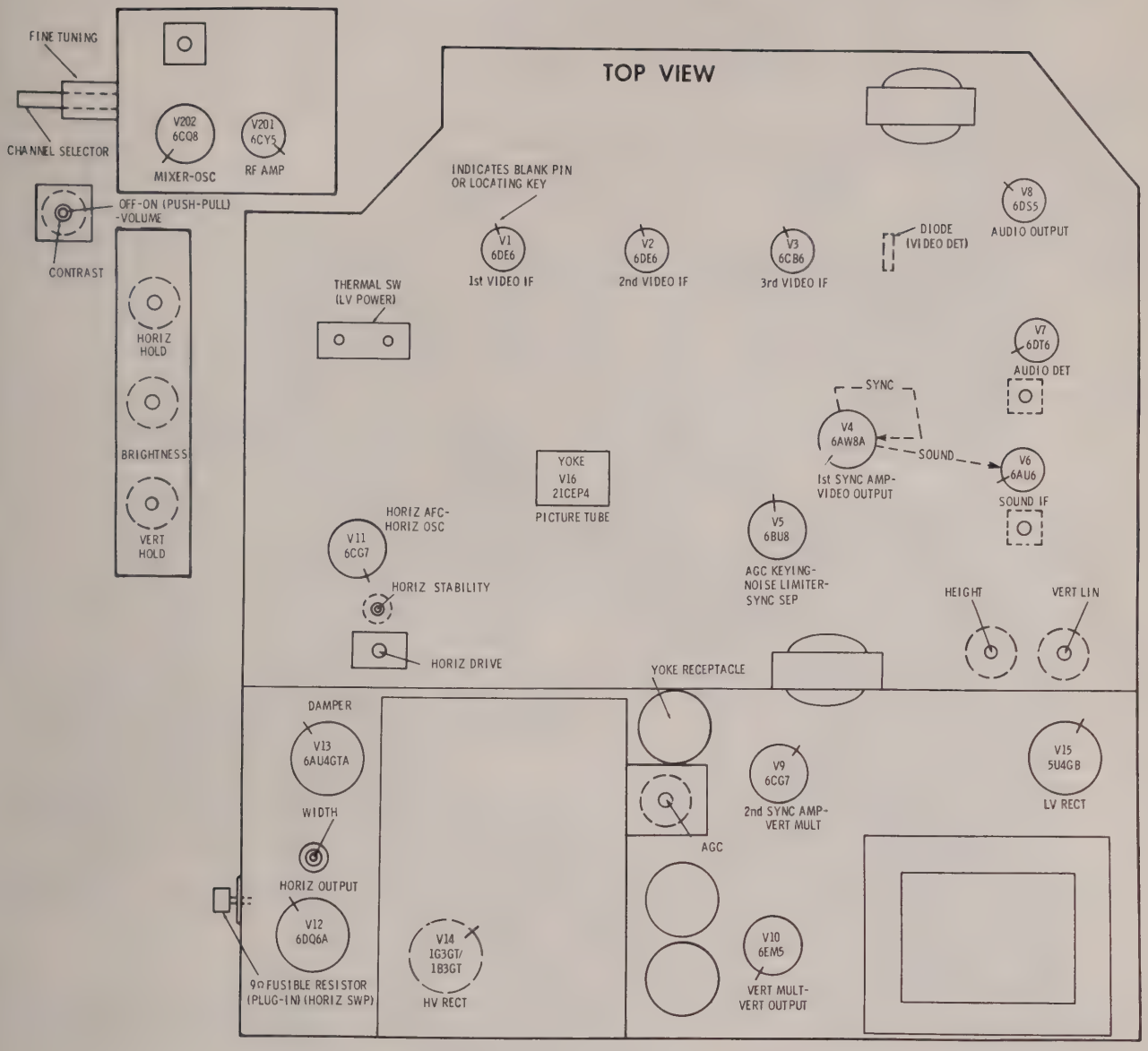
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JA415

SET 453 FOLDER 1


SOUND IF V6 6AU6
AUDIO DET V7 6DT6
AUDIO OUTPUT V8 6DS5
1ST VIDEO IF V1 6DE6
2ND VIDEO IF V2 6DE6
3RD VIDEO IF V3 6CB6
VIDEO OUTPUT V4A 6AW8A
1ST SYNC AMP V4B 6AW8A
SYNC SEP-AGC KEYING-NOISE LIMITER V5 6BU8
2ND SYNC AMP V5A 6CG7
VERT MULT V9B 6CG7
VERT MULT VERT OUTPUT V10 6EM5
HORIZ AFC V11 6CG7
HORIZ OSC
HORIZ OUTPUT V12 6DQ6A
LV RECT V15 5U4GB
HV RECT V14 1G3GT/1B3GT
DAMPER V13 6AU4GTA
PICTURE TUBE V16 21CEP4
VOLUME
CONTRAST
BRIGHTNESS
HEIGHT
VERT LINEARITY
VERT HOLD
HORIZ FREQ
HORIZ STABILIZING
HORIZ DRIVE
WIDTH
HORIZ HOLD
AGC
SW ON VOLUME CONTROL
THERMAL SWITCH
TO TUNER IF OUTPUT
TO TUNER RF AGC
TO TUNER HIGH B+
TO TUNER LOW B+
TO WIDTH COIL (L24)
TO FUSIBLE RESISTOR R103 (LV POWER SUPPLY)
TO PICTURE TUBE HV ANODE
TO BLANKING NETWORK (PICTURE TUBE & T GRID CIRCUIT)
TO TERMINAL 6 OF YOKE SOCKET
DEFLECTION YOKE
HORIZ. OUTPUT TRANSFORMER TERMINAL BOARD
L17 TERMINAL GUIDE
L18 TERMINAL GUIDE
L19 TERMINAL GUIDE
L22 & L23 TERMINAL GUIDE
L24 TERMINAL GUIDE
L4, L7 & L8 TERMINAL GUIDE
DO NOT MEASURE
TAKEN WITH PIN 4 OF VERT MULT TUBE (V9B) SHORTED TO GROUND, AND HEIGHT CONTROL (R5) SET AT CENTER OF ROTATION.
ADDITIONAL SCHEMATICS PAGE
TUNER 107016 (KRK70DI VHF.... 7
TUNER 107170 (KRK46AA) & 107019 (KRK72L) VHF.... 11
TUNER 107018 (KRK71D, E) VHF with UHF provisions.... 12
TUNER 107171 (KRK47AA) & 107020 (KRK71L) VHF with UHF provisions.... 17
TUNER KRK66A, J, P (UHF) 18
DENOTES CHASSIS GROUND
MEASURED FROM PIN 6 OF V4
MEASURED FROM PIN 7 OF V2
MEASURED FROM PIN 3 OF V11
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE
© Howard W. Sams & Co., Inc. 1959
RCA VICTOR CHASSIS KCS124C,
D, E, F, H, J, K, L

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Thermal Switch, Fuse Wire (Fil), V15

SWEEP FAILURE
No raster, has sound Fusible Resistor (9Ω), V11, V12, V13, V14, V15, V16
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, V15
Vert. off freq. V9, V10
Horiz. off freq. V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V16
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V4, V5, V9
No horiz. sync V4, V5, V9, V11
No vert. or horiz. sync V4, V5, V9

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:

A1 thru A5, A7 thru A10	GENERAL CEMENT #8606, 8606L, 8282, 9295 WALSCO #2526, 2543, 2544, 2545
A6	GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290 WALSCO #2512, 2515, 2522, 2523, 2525, 2537
All	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987 WALSCO 2531

VIDEO IF ALIGNMENT

Connect the negative lead of a 6 volt bias supply to point Ⓐ . Positive to chassis.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	1500mmf Ceramic Capacitor	High side to Mixer Grid wafer contact thru access hole (adjacent to Mixer Grid wafer) located in left side of tuner shield. Low side to chassis.	44.5MC (Unmod)	Any non-interfering channel	DC probe to point Ⓑ. Common to chassis. (Across Video Det. load.)	A1	Adjust for maximum gain. Adjust generator output for 3 volts on meter when finally peaked.
2.	"	"	45.5MC	"	"	A2	"
3.	"	"	43.0MC	"	"	A3	"
4.	"	"	47.25MC	"	"	A4, & Mixer Plate Coil (Top)	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 6 volt bias supply to point Ⓐ and -3 volts to point Ⓒ . Positive to chassis.
Connect a 180Ω resistor from pin 5 (plate) to pin 6 (screen) of the 1st Video IF Amplifier.
Loosely couple signal generator to sweep output cable to provide markers.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1500mmf Ceramic Capacitor	High side to Mixer Grid wafer contact thru access hole (adjacent to Mixer Grid wafer) located on left side of tuner shield. Low side to chassis.	45MC (10MC Swp)	42.5MC 45.75MC	Any non-interfering channel	Vert. Amp. thru demodulator probe to pin 5 (plate) of 1st Video IF. Low side to chassis.	A5, A6, & Mixer Plate Coil (Bottom)	Use only enough sweep generator output to provide a usable pattern on scope. Calibrate scope for .5 volts peak to peak. Adjust for maximum gain and symmetry of response similar to Fig. 1. with markers as shown. Remove 180Ω resistor from 1st Video IF.
6.	"	"	"	42.5MC 45.0MC 45.75MC	"	Vert. Amp. thru 10K to point Ⓑ . Low side to chassis.	A1, A2, A3	Cablibrate scope for 5 volts peak to peak. Check for response similar to Fig. 2. If necessary, retouch A1, A2 and A3 for desired response.
7.	Fig. 3	High side thru pad (Fig. 3) to Mixer Grid wafer contact thru access hole (adjacent to Mixer Grid wafer) located in left side of tuner shield. Low side to chassis.	Not used	45.75MC	"	USE VTVM DC probe to point Ⓑ Common to chassis.		Adjust generator output to provide exactly 1.5 volts on VTVM.
8.	1500mmf Ceramic Capacitor	Remove pad and connect as in step 5.	45MC (10MC Swp)	41.25MC	"	USE VTVM. DC probe to point Ⓑ. Common to chassis. Connect scope as in step 6.	A1, A3	Retouch for 1.2 to 1.5 volts on VTVM while maintaining response similar to Fig. 2.
9.	Fig. 4	Across antenna terminals thru matching network (Fig. 4).	Each VHF channel in turn	42.5MC 45.0MC 45.75MC	All VHF channels	Vert. Amp. thru 10K to point Ⓑ . Low side to chassis.	A1, A2	Retouch A1 and A2 SLIGHTLY to correct for tilt or any other condition that is approximately the same on all channels.

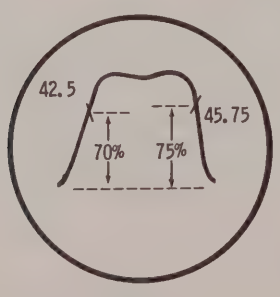


FIG.1

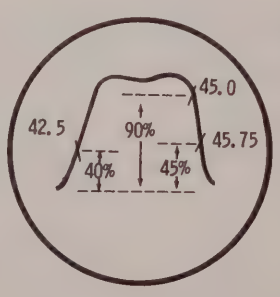


FIG.2

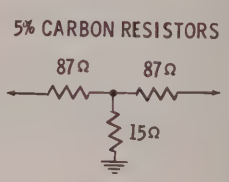
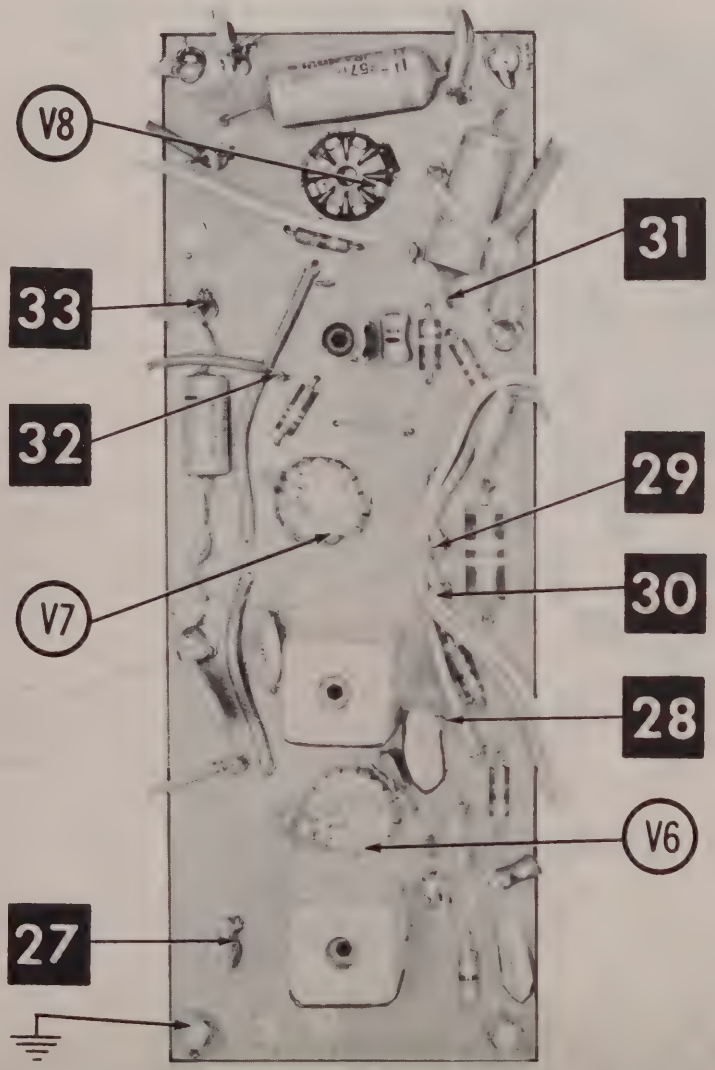


FIG.3

continued PAGE 25

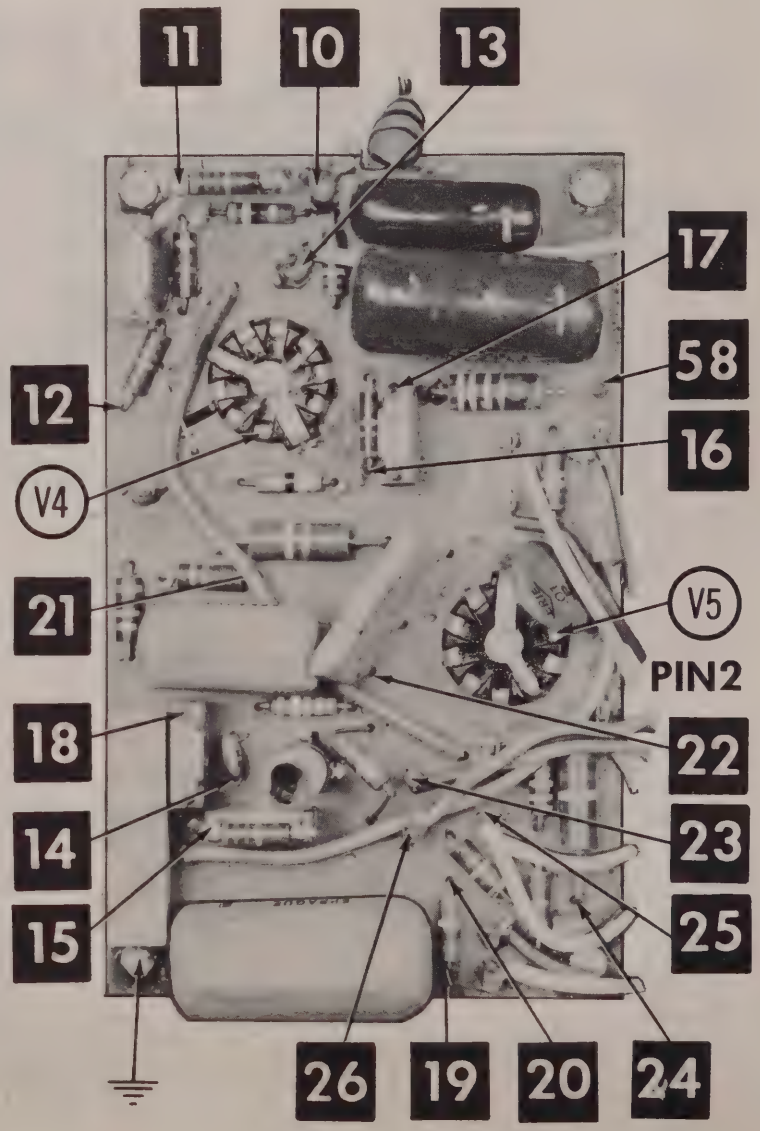
CHASSIS TOP VIEW

CircuiTrace Numbers 27 thru 33



SOUND PRINTED BOARD

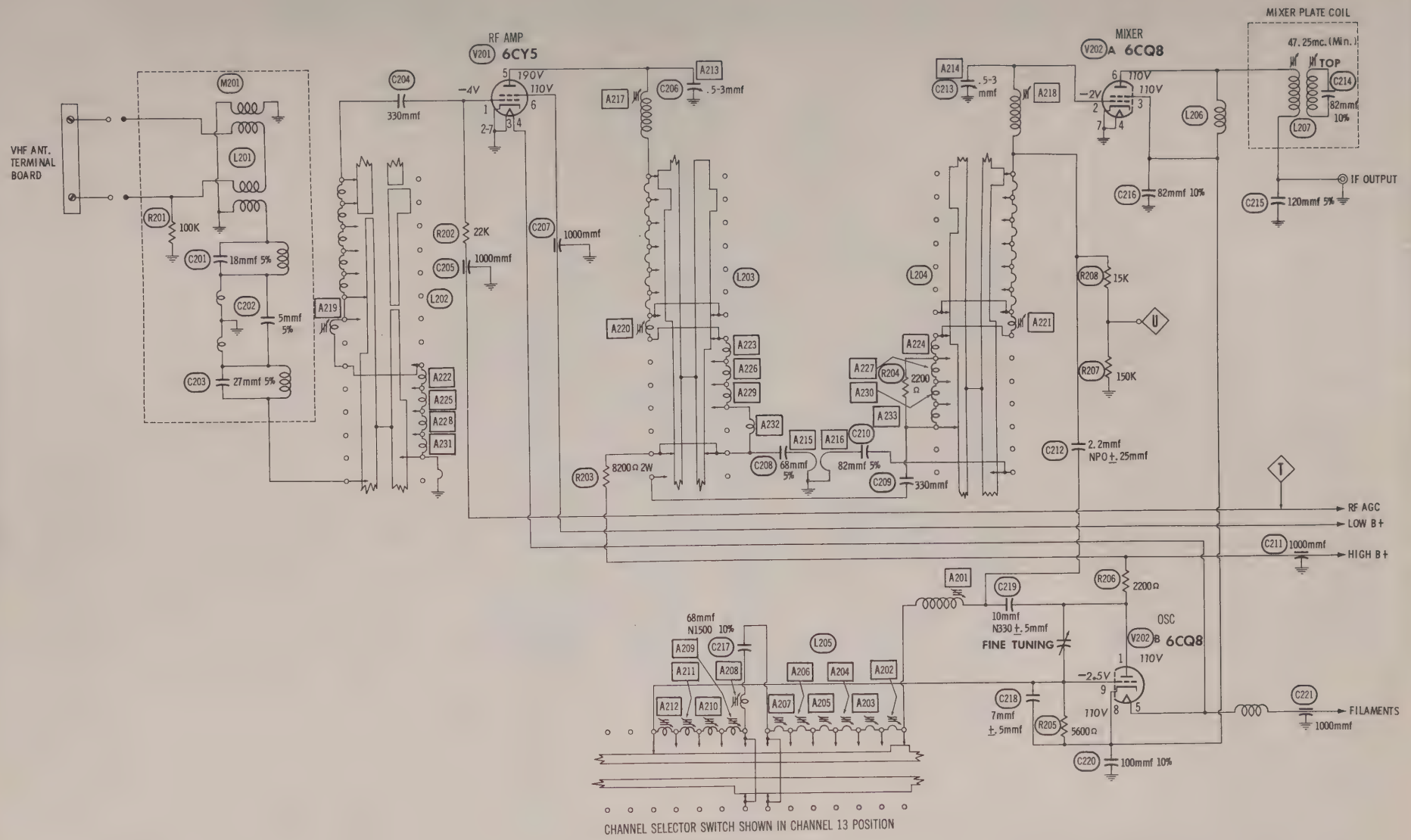
CircuiTrace Numbers 10 thru 26



VIDEO PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1959

VHF TUNER 107016 (KRK70D)

RCA VICTOR CHASSIS KCS124C, D, E, F, H, J, K, L

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: A201 thru A212, A213 thru A216 .... General Cement #5009, 8195, 8274, 8275, 8728, 8987
Walsco #2531
A217 thru A221 ..... General Cement #5000, 5003, 5009, 8290
Walsco #2520, 2523, 2525, 2537

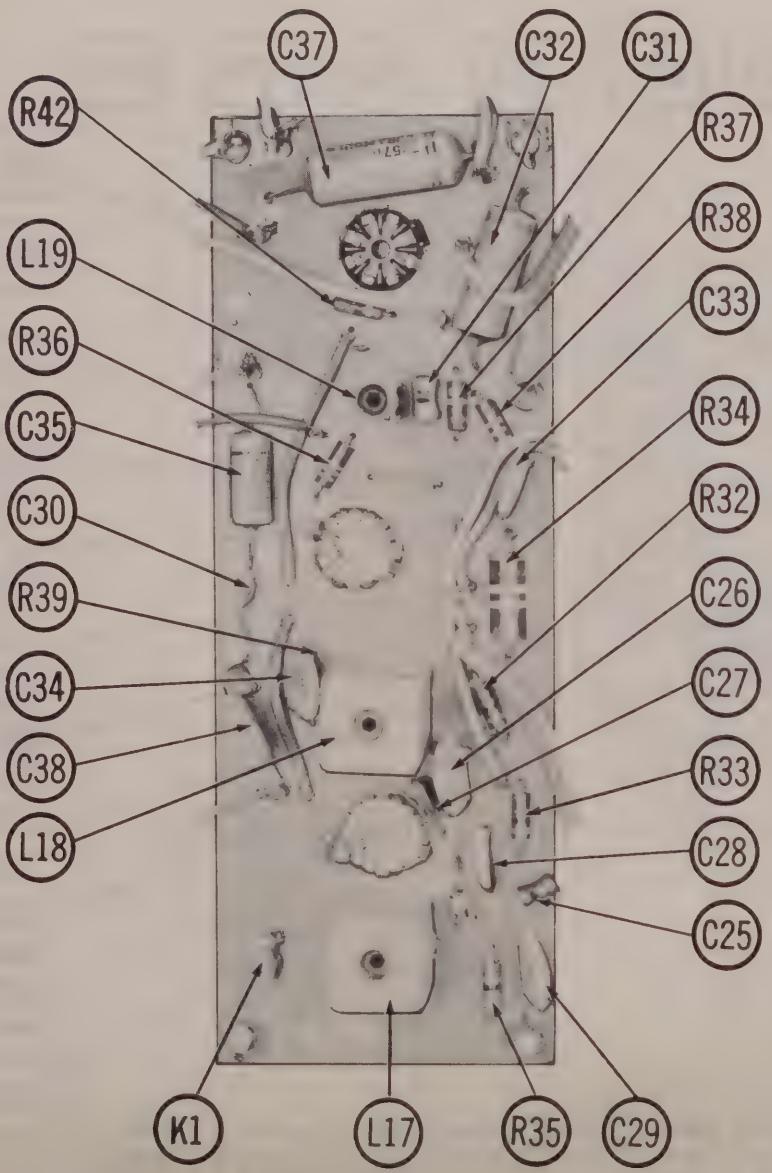
TUNER ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (T) . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Unplug IF output cable from the tuner and connect a 39Ω resistor in series with a .001mfd capacitor across IF output socket in tuner.

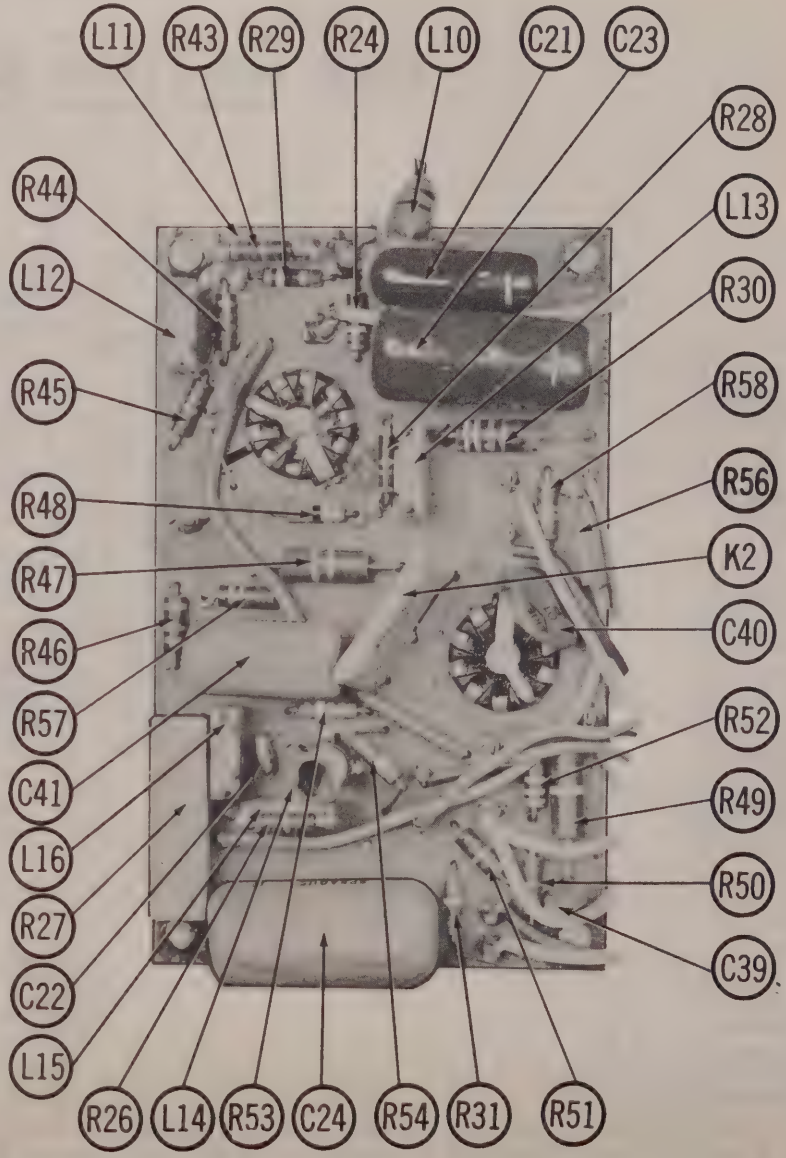
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals thru pad (Fig. 201).	Not used	257MC	13	Vert. Amp. thru diode probe to point (U) . Low side to chassis.	A201	Adjust for zero beat on scope.
2.	"	"	"	251MC	12	"	A202	"
3.	"	"	"	245MC	11	"	A203	"
4.	"	"	"	239MC	10	"	A204	"
5.	"	"	"	233MC	9	"	A205	"
6.	"	"	"	227MC	8	"	A206	"
7.	"	"	"	221MC	7	"	A207	"
8.	"	"	"	129MC	6	"	A208	"
9.	"	"	"	123MC	5	"	A209	"
10.	"	"	"	113MC	4	"	A210	"
11.	"	"	"	107MC	3	"	A211	"
12.	"	"	"	101MC	2	"	A212	"
13.	"	"	183MC	181.25MC 185.75MC	8	"	A213, A214, A215, A216	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. Adjust A213 for marker position, A214 for proper bandwidth, A215 for proper tilt, and A216 for maximum gain.
14.	"	"	213MC	211.25MC 215.75MC	13	"	A217, A218	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. Adjust A217 for proper marker positions, A218 for proper tilt and retouch A214 for proper bandwidth.
15.	Repeat steps 13 and 14 for proper tracking and response on all channels from 13 to 7. Repeat step 1. Turn off generators and measure oscillator injection voltage at point (U) with VTVM. The reading obtained should be between -2.5 to -5.5 volts. If outside these limits replace V202 and repeat steps 1 thru 14.							
16.	Repeat step 8.							
17.	Fig. 201	Across antenna terminals thru pad (Fig. 201)	85MC	83.25MC 87.75MC	6	Vert. Amp. thru demodulator probe to point (U) . Low side to chassis.	A219, A220, A221	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown . Adjust A219 for maximum gain, A220 for proper marker positions and A221 for proper tilt.
18.	"	"	79MC	77.25MC 81.75MC	5	"	A222, A223, A224	If necessary, adjust appropriate coil for response similar to Fig. 202.
19.	"	"	69MC	67.25MC 71.75MC	4	"	A225, A226, A227	"
20.	"	"	63MC	61.25MC 65.75MC	3	"	A228, A229, A230	"
21.	"	"	57MC	55.25MC 59.75MC	2	"	A231, A232, A233	"

CONTINUED PAGE 21

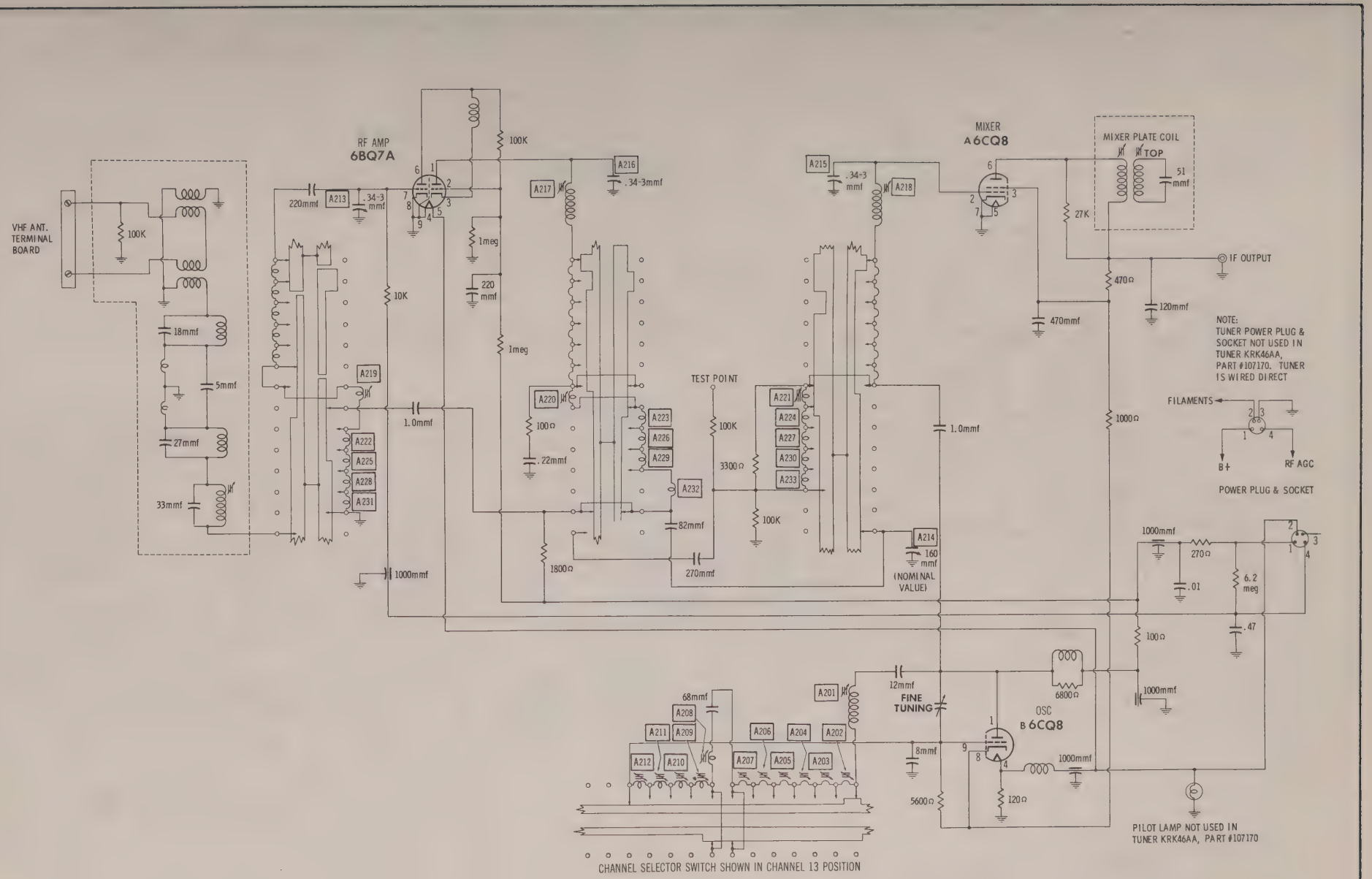
TUNER 107016 (KRK70D) - RIGHT SIDE



SOUND PRINTED BOARD



VIDEO PRINTED BOARD

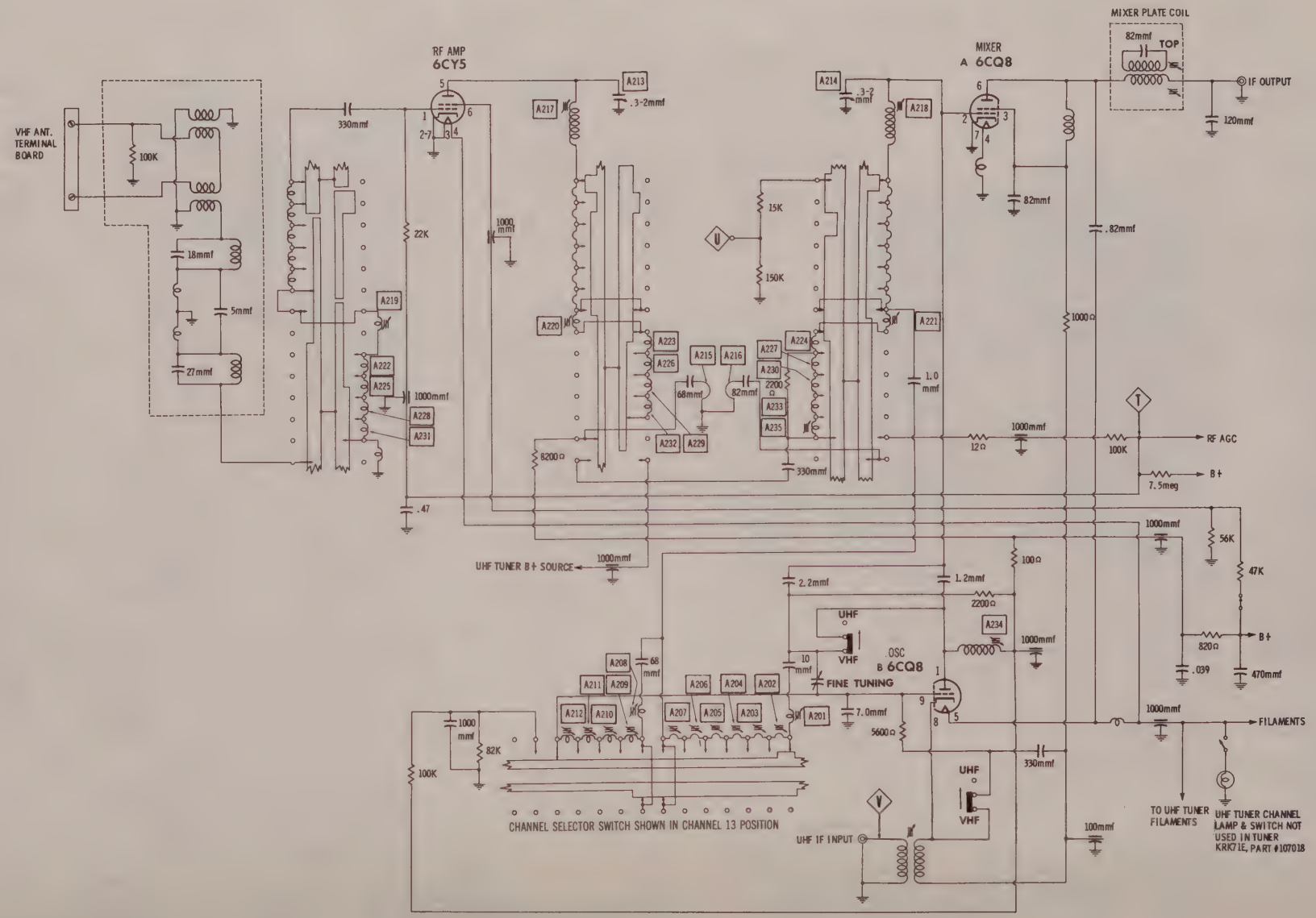


A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1959

VHF TUNER 107170 (KRK46AA) & 107019 (KRK72L)

RCA VICTOR CHASSIS KCS124C, D, E, F, H, J, K, L



A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1959

VHF TUNER with UHF provisions 107018 (KRK71D, E)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st Video IF Amp.	6DE6	
V2	2nd Video IF Amp.	6DE6	
V3	3rd Video IF Amp.	6CB6	
V4	Video Output-1st Sync Amp.	6AW8A	
V5	AGC Keying-Noise Limiter-Sync Sep.	6BU8	
V6	Sound IF Amp.	6AU6	
V7	Audio Det.	6DT6	

ITEM No.	USE	TYPE	NOTES
V8	Audio Output	6DS5	
V9	2nd Sync Amp. -Vert. Mult.	6CG7	
V10	Vert. Mult. -Vert. Output	6EM5	
V11	Horiz. AFC-Horiz. Osc.	6CG7	
V12	Horiz. Output	6DQ6A	
V13	Damper	6AU4GTA	
V14	HV Rect.	1G3GT/1B3GT	
V15	LV Rect.	5U4GB	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	RCA Victor PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V16	21CEP4	21CEP4 ①	21CEP4 ①	21CEP4/21CEP4A ②	① Aluminized ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲100	400	104091	AFH2-100-50	B0726	FP256	TMS-61 TD-20-450	TVL-2813	
B	▲20	400							
C2A	▲100	400		AFH4-103-40	D0805	FP421.3	TMQ-196	TVL-3819 TVA-1410	①
B	▲20	350							
C	■10	400							
D	20	50							

① Some versions may use 100mfd @ 400V, 20mfd @ 250V, 10mfd @ 400V, 20mfd @ 50V in this application (Part #102411).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.47	200	10%	79148A	V84C2P47		PM2P47	GTM-2047	2TM-P47	
C4	39000			105479		DF-403	BYB6S4	GEM-614	6TM-S4	①
C5	470			77293	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	②
C6	10-160			100849						
C7	470			77293	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C8	18		NPO 5%	102646		TCZ-18	C10Q18C	CNO-418	5TCC-Q18S 5% *	
C9	2200			104899	BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	
C10	470			104380	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C11	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C12	1000			77252	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C13	1000			102234A	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C14	1000			77252	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C15	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C16	1000			102234A	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C17	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C18	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C19	7		NPO ±.5mmf	104177						
C20	5		±.5mmf	104178	NPO-DI 5				5TCCB-V5	
C21	.1	200		106374	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C22	9		NPO ±1mmf	104211						
C23	.47	200		106111	P288N-47		CUB2P47	GEM-2047	2TM-P47	
C24	.22	600		106818	P688N-22		CUB6P22	GEM-6022	6TM-P22	
C25	3	1000	N750 ±1mmf	102415						
C26	10000			73960	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C27	680			104135	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68	
C28	2700		10%	104131	DI-2700		BYA10D27		5GA-D27	
C29	10000			73960	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C30	680		10%	104135	DI-680	D6-681		JL-368	5GA-T68S 10% *	
C31	10		N470 10%	105658						
C32	.047	200		105775	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C33	10000			73960	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C34	10000			73960	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C35	.001	600		104323	P688N-001	DD-102	CUB6D1	GEM-621	6TM-D1	③
C36	.01	200		101000A	P288N-01	DF-103	CUB2S1	GEM-411	2TM-S1	④
C37	.0047	1000	10%	73805				GEM-16247	10TM-D47	⑤
C38	10000			73960	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	④
C39	470			78622	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C40	10000			73960	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C41	.1	400		106110	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C42	.033	400		105318	P488N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C43	220		10%	104144	1469-00022	D6-221	22R5T22	JL-322	MS-322	
C44	.0056	600	10%	104906				GTM-6256	6TM-D56S *	
C45	.0047	600	10%	73920	V84C6D47		PM6D47	GTM-6247	6TM-D47	
C46	.0056	400	10%	73788				GTM-4256	6TM-D56S *	
C47	.01	200	10%	79316	V84C2S1		PM4S1	GTM-211	4TM-S1	
C48	.027	600	10%	75345	P684CM-027				6TM-S27S *	
C49	.15	200	10%	104146	V84C2P15		PM2P15	GTM-2015	2TM-P15	
C50	.012	400	10%	79781					4TM-S12S *	
C51	.039	400	10%	73790	P484CM-039			GTM-414	4TM-S4	
C52	.022	600	10%	107047	V84C6S22		PM6S22	GTM-6122	6TM-S22	
C53	.001	1600		73849	P1684CM-001	DD30-102	CUB16D1	GEM-1621	MB-D1	
C54	.047	400		73553	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C55	.0047	400		73920	P488N-0047	DD-472	CUB4S47	GEM-4247	4TM-D47	
C56	33		10%	105348	DI-33	DD-330	L10Q33	CNO-433	5GA-Q33S 10% *	
C57	220		N750 10%	105245	N750-DI 220	DTN-220	C10T22U	CN7-322	5TCU-T22S 10% *	
C58	.022	200		105670	P288N-022	DD-203	CUB4S22	GEM-4122	2TM-S22	
C59	.33	200		105671	P288N-33		PM4P33	GEM-2033	6TM-P33	
C60	470	1000	5%	105672	1468-HV10-00047 5% *					
C61	.01	400	10%	105676	V84C4S1		PM4S1	GTM-411	4TM-S1	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No	RATING CAP.	VOLT	TOL	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C62	680			105518	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68	
C63	820		10%	106080	1469-00082		1H5T82		MS-382	
C64	390	1000	10%	105675		D6-391	L10T39		5GA-T398 10% *	
C65	10-160			104341						
C66	470			77283	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C67	.47	200		73787	P288N-47		CUB2P47	GEM-2047	2TM-P47	
C68	.1	600		73557	P488N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C69	.27	200	10%	73798				GEM-6027	2TM-P278 *	
C70	.1	600	10%	73557	V94C6P1		PM6P1	GTM-601	6TM-P1	
C71	.1	400		73631	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C72	.068	1000		73815	P1088N-068		CUB10S68	GEM-10S68	10TM-S68	
C73	.1	600		73631	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C74	.039	400	10%	73790	P684CM-039			GTM-414	4TM-S398 *	
C75	00082	1000	10%	106759						
C76	560	3000	N3300 10%	106307						
C77	330	2000	N2200 10%	102177						
C78	150	2500	10%	103536						
C79	91	3500	10%	103535						
C80	120	2500	10%	103536						
C81	470			77293	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C82	.047	600		73592	P488N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① With Tuners KRK46AA, 47AA, 72L, 73L a 10000mmf is used (Part #73960).
② Not used with Tuners KRK46AA, 47AA, 72L, 73L.
③ Ch. KCS134H, J use .0022mfd ⑤ 500V in this application (Part #104134).
④ Not used in Ch. KCS134H, J.
⑤ Ch. KCS134JL, J use a .0033mfd ⑤ 1000V in this application (Part #73819).

CONTROLS

ITEM No	RATING RESISTANCE	WATTS	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3000Ω	½	106223					Contrast, Tap ⑥ 2850Ω, ①
B	1meg	½						Volume, Tap ⑥ 125K, ①
C	Switch							Push Pull Off/On
R2	40K	½	106227					Horiz. Hold, ②
R3A	200K	½	104088	B-46	A47-200K-S	Q11-129	U43	Brightness, ③
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1.5meg	½	104089	B-742	A47-1.5meg-S	Q11-138	U155	Vert. Hold, ④
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	5meg	½	106290	AB-87	A47-5meg-S	Q11-141	SU-67	Height
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R6A	1.5meg	½	102408	B-742	B47-1.5meg-S	B11-138	TA155L	Vert. Lin.
B	Shaft			Not Req.	Not Req.	TM2	Not Req.	
R7A	200K	½	106756	BX-46	B47-200K-S	B11-129	U43	AGC
B	Shaft			Not Req.	Not Req.	TM2	Not Req.	

① Ch. KCS124E, F use Part #106222 in this application.
② Ch. KCS124H, J use Part #106661 in this application.
Ch. KCS124E, F use Part #106238 in this application.
③ Ch. KCS124E, F use Part #106225 in this application.
④ Ch. KCS134E, F use Part #106226 in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	WATT	RCA Victor PART No.	NOTES
R8	7.5meg 5%	1		Note 1
R9	47K	1		Note 2
R10	56K			Note 2
R11	8200 5%	1		Note 3
R12	120Ω			
R13	33K 5%			
R14	680Ω			
R15	15K			
R16	100K			
R17	62Ω 5%			
R18	150K 5%			
R19	150K 5%			
R20	680Ω			
R21	220 5%			
R22	470Ω			
R23	180Ω 5%			
R24	680K			
R25	820Ω			
R26	8200Ω			
R27	5800Ω	5	107025	
R28	820Ω			
R29	39Ω			Note 4
R30	47K	1		Note 5
R31	150K			
R32	1000Ω			
R33	1000Ω			
R34	15K	2		
R35	82Ω			
R36	560K			
R37	120K			
R38	470K			
R39	560Ω			
R40	47K			Note 6
R41	1800Ω	4	104834	
R42	270Ω			
R43	8200Ω			
R44	18000 5%			
R45	2200Ω 5%			
R46	82K			
R47	22K	1		
R48	39Ω			
R49	220K	1		
R50	2.2meg 5%			
R51	820K 5%			
R52	470K 5%			
R53	39K			
R54	56K			
R55	390K			
R56	8200Ω			
R57	22K			
R58	820K			
R59	10K	1		
R60	2700Ω			
R61	560K			
R62	56K			
R63	68K			
R64	18K			
R65	6.8meg			
R66	1.2meg			
R67	470K			
R68	8200Ω			
R69	18K	1		
R70	18K			
R71	22K			
R72	2900Ω			
R73	470K			
R74	680K			
R75	220Ω	4	107048	
R76	2200Ω			
R77	3300Ω			
R78	22K			
R79	560VCT ⑤ .27A	5W ⑤ 3A		
R80	3.5Ω Cold			
R81	150Ω			
R82	330K			
R83	820K			
R84	68K	1		
R85	180K			
R86	270K			
R87	3300Ω			
R88	56K 5%			
R89	1meg			
R90	10meg			
R91	10meg			
R92	47Ω			
R93	4700Ω	3	104835	
R94	100Ω	7		
R95	68K			
R96	220K			
R97	100K			
R98	4700Ω			
R99	.39Ω		104181	
R100	1000Ω			
R101	4700Ω	7	105074	
R102	820K			
R103	9Ω		104295	

Note 1. With Tuners KRK46AA, 47AA, 72L, 73L a 6.2meg is used.
Note 2. Not used with Tuners KRK46AA, 47AA, 72L, 73L.
Note 3. With Tuners KRK46AA, 47AA, 72L, 73L a 2700 5% is used.
Note 4. Some versions may use 12Ω in this application.
Note 5. Some versions may use 39K in this application.
Note 6. Not used in Ch. KCS124H, J.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No.	REPLACEMENT DATA
X1	Sound IF Grid	56mmf, 47K	104329	Centralab RC-42 Sprague FRC-1
X2	Sync Separator Grid	330mmf, 330mmf, 270K, 1.5meg, 2.7meg	107026	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA RCA Victor PART No.	Gromer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	47.25MC Trap	104141						
L2	RF Choke							
L3	1st Video IF	104140						
L4	1st Choke							
L5	1st Choke							
L6	2nd Video IF	104139						
L7	3rd Video IF	104139						
L8	4th Video IF	104139						
L9	RF Choke	102639	19-1006	19-1006	TV-192	6152		18uh
L10	RF Choke	102639	19-1006	19-1006	TV-192	6152		18uh
L11	Shunt Peaking Coil	107166	19-3250 *	19-3250 *	TV-185 *	6181 *	VP-6 *	250uh ①
L12	Shunt Peaking Coil	104906	19-3180	19-3180	TV-184	6180	VP-5	180uh
L13	Shunt Peaking Coil	107165	19-3060	19-3060	TV-183	6110		62uh
L14	4.5MC Trap	104903						
L15	Series Peaking Coil	107167	19-3300 *	19-3300 *	TV-199 *	6155 *		300uh ①
L16	Shunt Peaking Coil	105916	19-3500	19-3500	TV-204	6174	VP-8	510uh
L17	1st Sound IF	104136						②
L18	2nd Sound IF	104137						③
L19	Quadrature Coil	104138						
L20	RF Choke	76810						4.7uh ③
L21	RF Choke	76510						4.7uh ③

* Parallel with 8200Ω resistor. ① Wound on 8200Ω resistor. ② Includes capacitors. ③ IRC Part #CL-1.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	SEC.	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L22	78Ω		105667						Horiz. Osc. tapped ② 21Ω
L23	45Ω		102196						Horiz. Stabilizer

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L24	Width Coil A Primary (1.5-11MH) B Secondary (.01-.1MH)	106220								

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L25	.270A	48Ω	.9 Hy.	100288	26C44 ①				26C44 ①	C-24X

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⑥ 1.8A	560VCT ⑥ .270A	5V ⑥ 3A	108062	26R47 ①	P-2872 ①		P-8172 ①	26R47 ①	R-69BC ①
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ⑥ 9A									

① Fabricate mounting.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	104085			V318				A-115X
T3	Yoke-Horiz. (15.6MH) (110°)-Vert. (1.8MH)	104078	Y-47 ①		Y-111 ①		DY-25A ①	Y-47 ①	Y-60-2
	Rear Cover & Centering Device	104460							YC-110
	Yoke Clamp	104409							
T4	Horiz. Output	106219	FLY-150 ② *	HVO-123 ① ② *	X166 *		HO-288 *	FLY-150 ② *	D-160*

① Use original rear cover and centering device.
② Drill new mounting hole(s).
* This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	5	5	5	5		5	5	5
	4	4	4	4		4	4	4
	3	3	3	3		3	3	3
	2	2	2	2		2	2	2
	1	1	1	1		1	1	1
Connect Width Coil Across	2 & 1	2 & 1	2 & 1	2 & 1		2 & 1	2 & 1	2 & 1
Special Notes →								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	7800Ω	3-4Ω	100037 ①	26848	A-3020	AU-804	A-3849	26848	S-92	① Used in Ch. KCS124C, D, E, F, K, L
	6400Ω	3-4Ω	76982 ②	24851	A-2931	AU-802	A-3878	24851	S-7X	② Used in Ch. KCS124H, J

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA RCA Victor PART No.	QUAM PART No.	NOTES
SP1	8"	PM	3-4Ω	74864 ①	8A2H	① Models 21T9265, 6, 7, & U, 21T9275, 6, 7, & U
	6" x 9"	PM	3-4Ω	101182 ②	6A3	② Models 21T9345, 6, 7, & U
	4"	PM	3-4Ω	79896 ③	4A07	③ Models 21T9122, 5, 7, & U, 21T9275, 6, 7, & U, 21T9345, 6, 7, & U

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA RCA Victor PART No. FUSE	HOLDER	LITTELFUSE PART No. FUSE	HOLDER	BUSS PART No. FUSE	HOLDER
M1	2 1/4"	#28	Wire					
M2	2 1/4"	#28	Wire					
M3	2 1/4"	#32	Wire					

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA RCA Victor PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M4	1N64	76675B	1N64	1N295	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M5	Tuner	107018	VHF (KRK70D) Ch. KCS124C, H
	Tuner	107019	VHF (KRK72L) Ch. KCS124J
	Tuner	107170	VHF (KRK46AA) Ch. KCS124K
	Tuner	107018	VHF with UHF provisions (KRK71D, E) Ch. KCS124D, J
	Tuner	107020	VHF with UHF provisions (KRK71J) Ch. KCS124F
	Tuner	107171	VHF with UHF provisions (KRK47AA) Ch. KCS124L
	Taner	106499	UHF (KRK56J, A, P) (Less Gears) Ch. KCS124L, J, F, D
M6	Thermal Switch	106542	
	Printed Board	104618	Sound, Less Tubes, Ch. KCS124C, D, E, F, K, L
	Printed Board	104106	Sound, Less Tubes, Ch. KCS124H, J
	Printed Board	106428	Video IF, Less Tubes
	Printed Board	107023	Video Less Tubes
	Printed Board	106574	Vertical, Less Tubes
	Printed Board	106160	Horizontal, Less Tubes

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO	DESCRIPTION
Safety Glass	106275	Models 21T9122, 5, 7, & U, 21T9265, 6, 7, & U, 21T9275, 6, 7, & U
Safety Glass	106522	Models 21T9345, 6, 7, & U
Mask	106270	Models 21T9265, 6, 7, & U, 21T9275, 6, 7, & U
Mask	106464	Models 21T9122, 5, 7, & U
Mask	106516	Models 21T9345, 6, 7, & U
Knob	106097	VHF Channel Selector, Models 21T9122
Knob	106096	VHF Channel Selector, Models 21T9127, 21T9266, 7, 21T9276, 7
Knob	106095	VHF Channel Selector, Models 21T9125, 21T9265, 21T9275

RCA VICTOR CHASSIS KCS124C, D, E, F, H, J, K, L

FOLDER 1

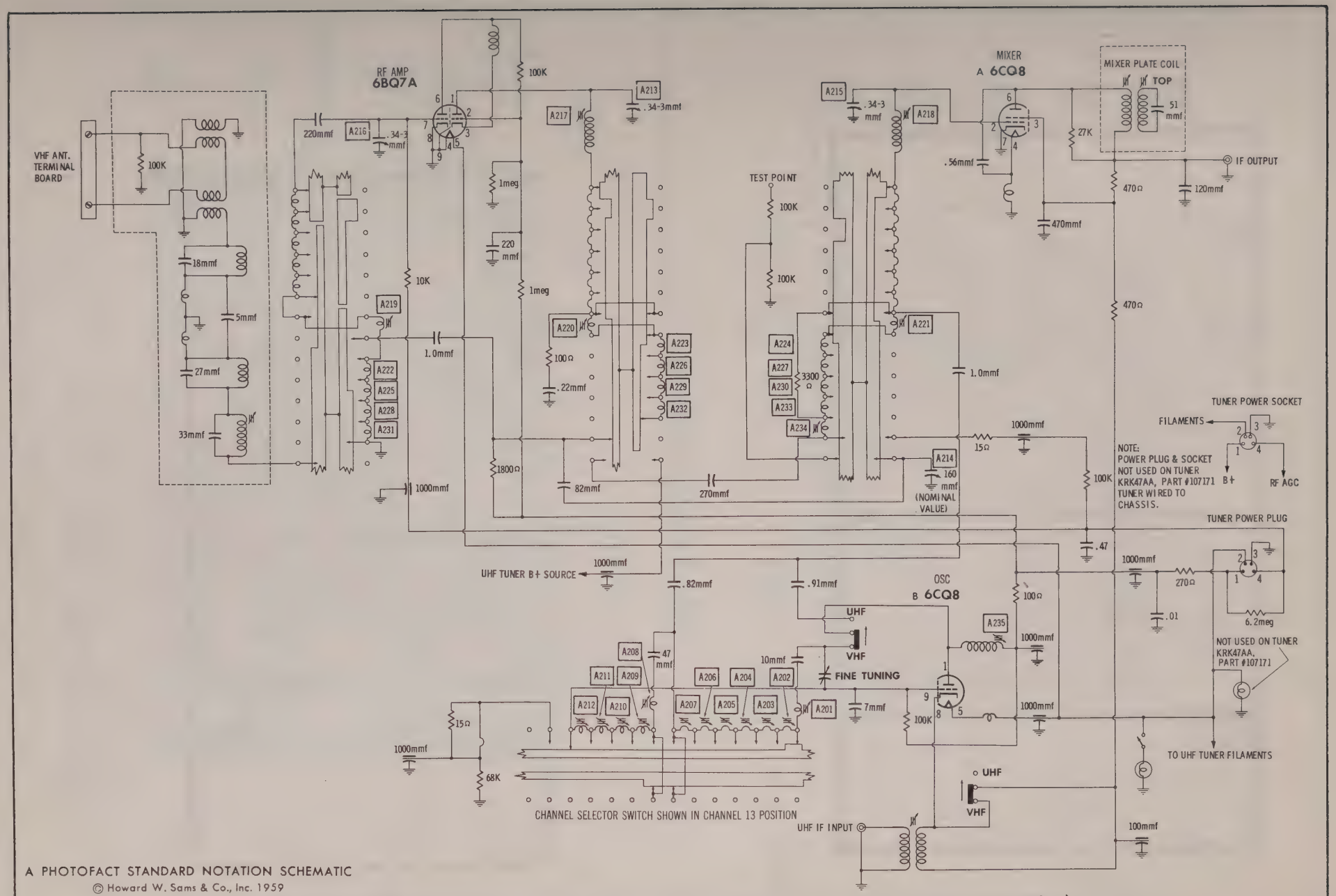
PARTS LIST AND DESCRIPTIONS (Continued)

CABINETS & CABINET PARTS (cont)

NAME	PART NO.	DESCRIPTION
Knob	106281	VHF Channel Selector, Models 21T9345U, 6U, 7U
Knob	106101	VHF Channel Selector, Model 21T9122U
Knob	106099	VHF Channel Selector, Models 21T9127U, 21T9266U, 7U, 21T9276U, 7U
Knob	106098	VHF Channel Selector, Models 21T9125U, 21T9265U, 21T9275U
Knob	106597	VHF Channel Selector, Models 21T9345, 6, 7, & U
Knob	106598	VHF Dial Assembly, Models 21T9345, 6, 7
Knob	106282	UHF Channel Selector, Models 21T9345U, 6U, 7U
Knob	106103	UHF Channel Selector, Models 21T9127U, 21T9266U, 21T9276U, 7U
Knob	106104	UHF Channel Selector, Model 21T9122U
Knob	106102	UHF Channel Selector, Models 21T9125U, 21T9265U, 21T9275U
Knob	106596	Fine Tuning, Models 21T9345, 6, 7, & U
Knob	104401	Fine Tuning, Models 21T9122, & U
Knob	104398	Fine Tuning, Models 21T9127, & U, 21T9266, 7, & U, 21T9276, 7, & U
Knob	104397	Fine Tuning, Models 21T9125, & U, 21T9265, & U, 21T9275, & U
Knob	101144B	UHF Tuning, Models 21T9345U, 6U, 7U
Knob	102580	UHF Tuning, Model 21T9122U
Knob	102578	UHF Tuning, Models 21T9127U, 21T9266U, 7U, 21T9276U, 7U
Knob	102653	UHF Tuning, Models 21T9125U, 21T9265U, 21T9275U
Knob	106599	VHF/UHF Dial Assembly, Models 21T9345U, 6U, 7U
Knob	106278	Volume, Models 21T9345, 6, 7, & U
Knob	106094	Volume, Models 21T9122, & U
Knob	106100	Volume, Models 21T9127, & U, 21T9266, 7, & U, 21T9276, 7, & U
Knob	106093	Volume, Models 21T9125, & U, 21T9265, & U, 21T9275, & U
Knob	102581	Brightness, Vert. Hold, Tone, Models 21T9122, 5, 7, & U, 21T9265, 6, 7, & U, 21T9275, 6, 7, & U
Knob	106279	Brightness, Vert. Hold, Tone, Models 21T9345, 6, 7, & U
Knob	106277	Contrast, Models 21T9345, 6, 7, & U
Knob	106092	Contrast, Models 21T9122, & U
Knob	106091	Contrast, Models 21T9127, & U, 21T9266, 7, & U, 21T9276, 7, & U
Knob	106090	Contrast, Models 21T9125, & U, 21T9265, & U, 21T9275, & U
Cabinet	Z4445	Models 21T9122, & U
Cabinet	Z4446	Models 21T9125, & U
Cabinet	Z4447	Models 21T9127, & U
Cabinet	M4528	Models 21T9265, & U
Cabinet	M4535	Models 21T9266, & U
Cabinet	M4529	Models 21T9267, & U
Cabinet	M4530	Models 21T9275, & U
Cabinet	M4536	Models 21T9276, & U
Cabinet	M4531	Models 21T9277, & U
Cabinet	M4532	Models 21T9345, & U
Cabinet	M4547	Models 21T9346, & U
Cabinet	M4533	Models 21T9347, & U
Escutcheon	106512	Preset Fine Tuning, Models 21T9345, 6, 7, & U
Leg	Y7038	Models 21T9265, & U
Leg	Y7044	Models 21T9266, & U
Leg	Y7039	Models 21T9267, & U

WIRING DATA

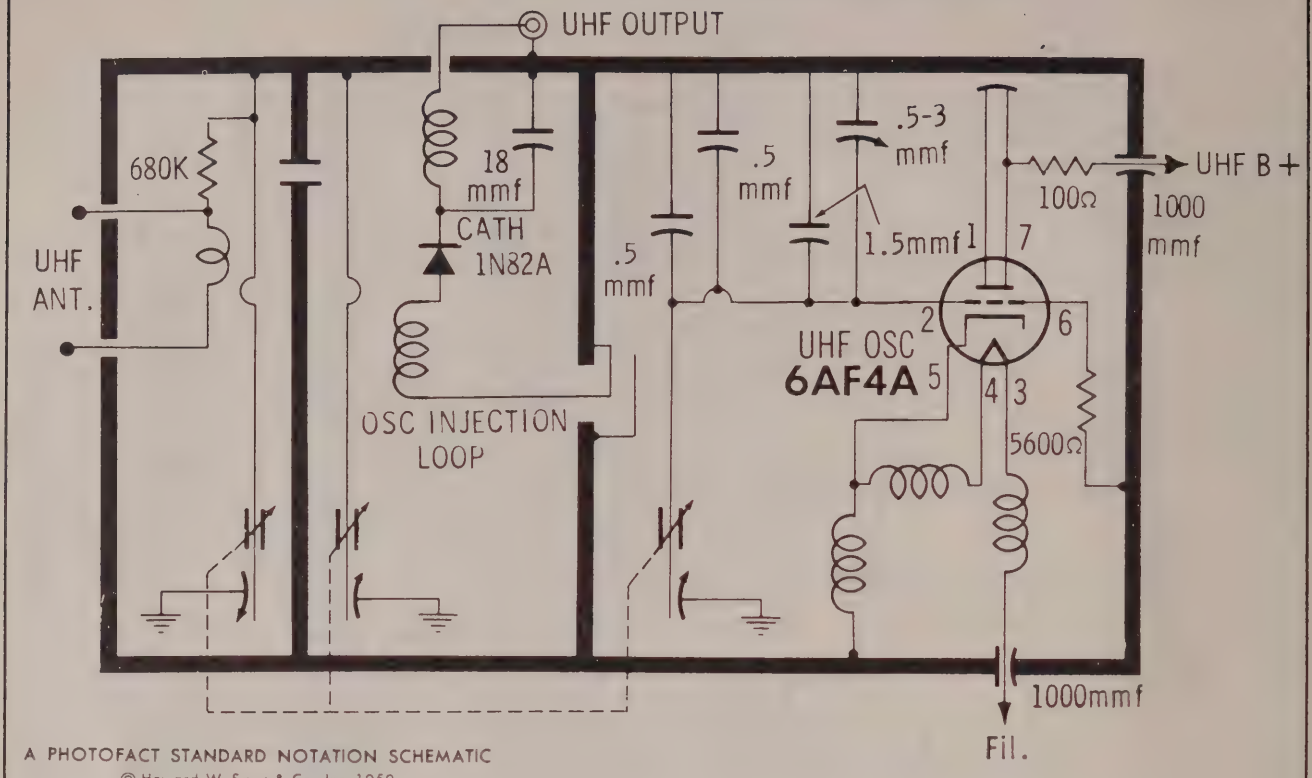
High Voltage Lead	Use BELDEN No.	8865
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1959

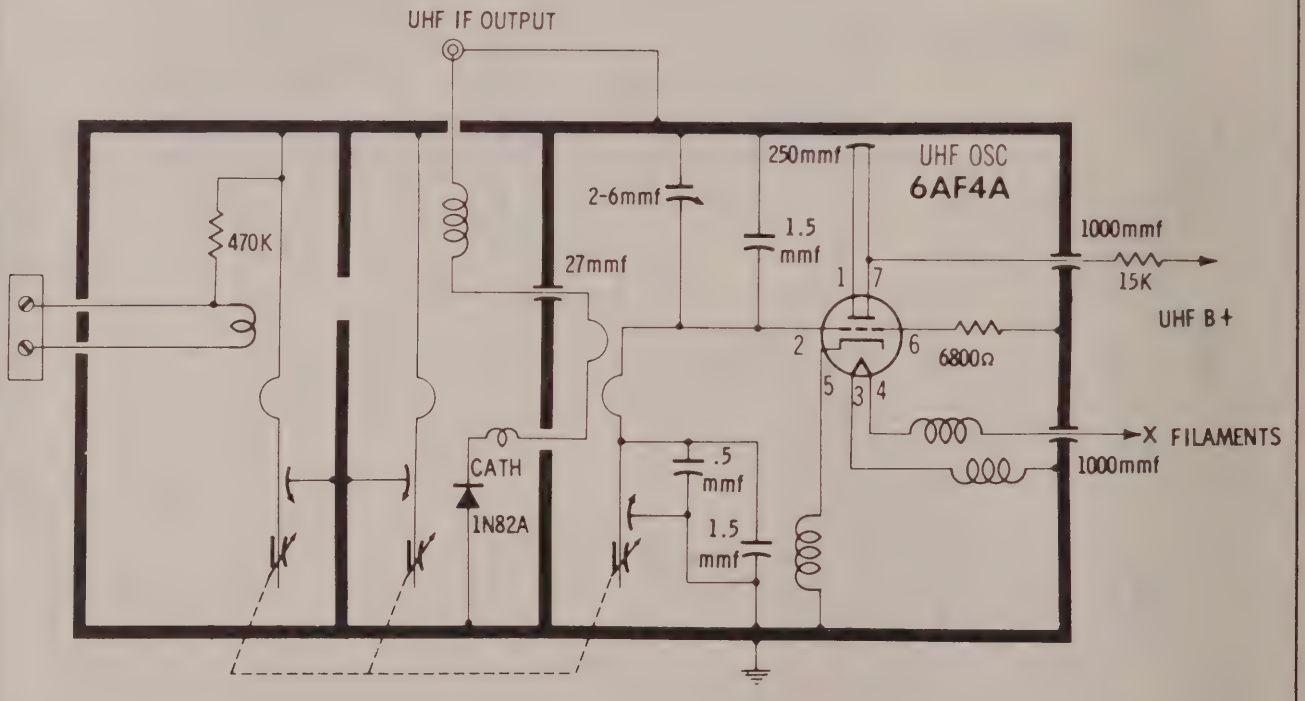
VHF TUNER with UHF provisions 107171 (KRK47AA) & 107020 (KRK73L)



A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1959

UHF TUNER KRK66A, J, P



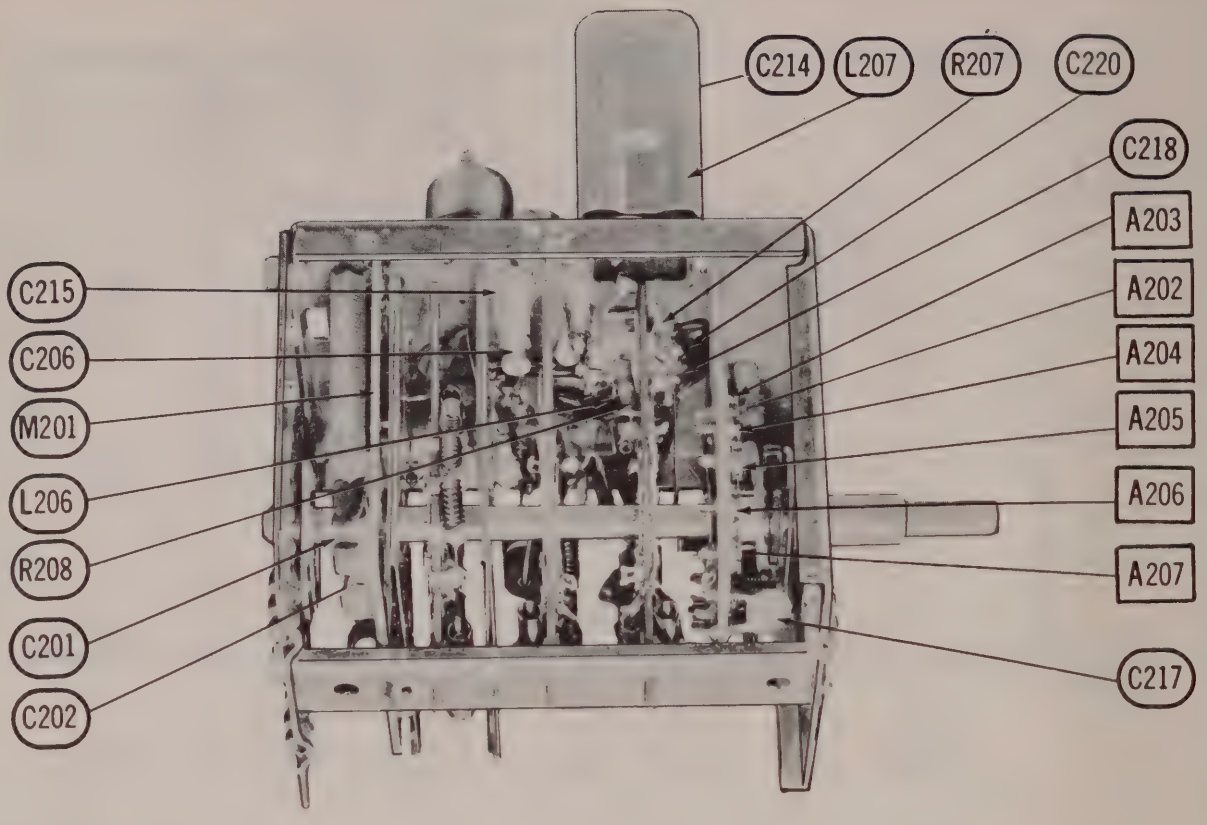
A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1959

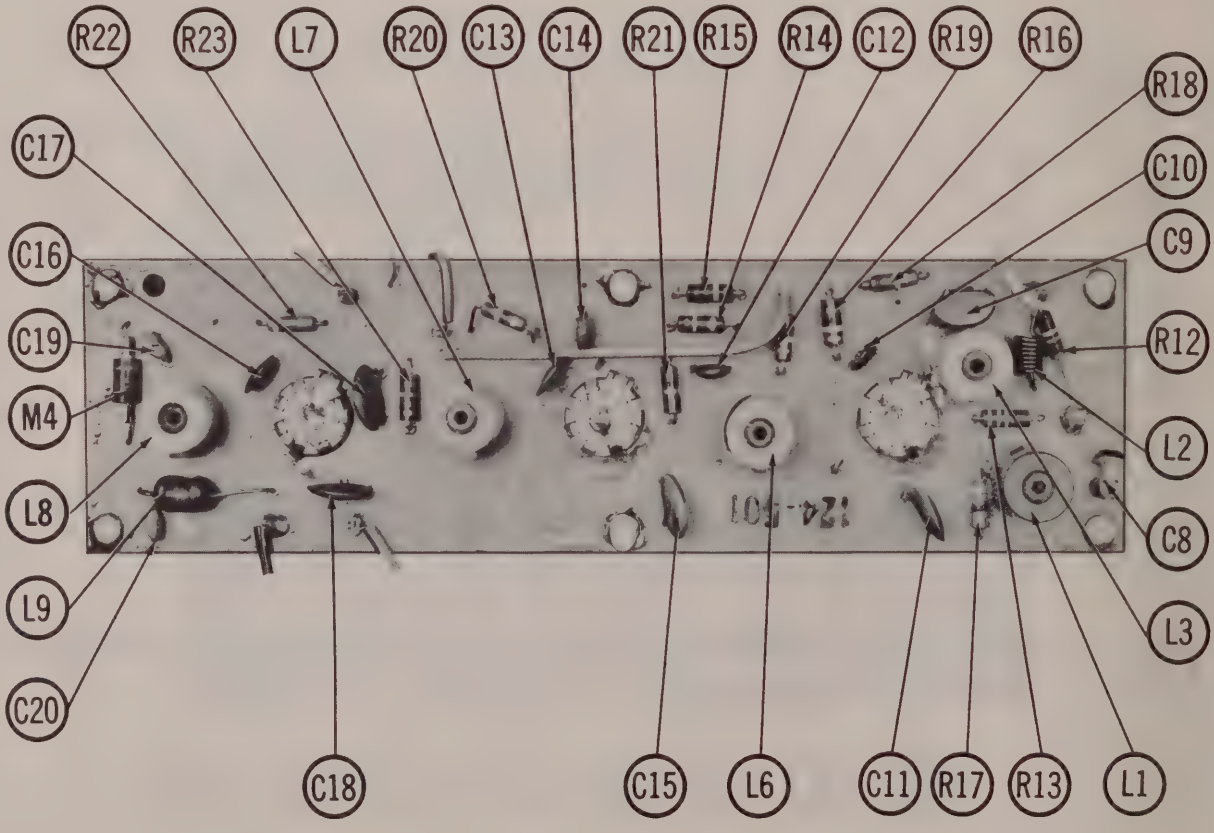
ALTERNATE CIRCUIT UHF TUNER KRK66A, J, P

HORIZ PRINTED BOARD

VERTICAL PRINTED BOARD



TUNER 107016 (KRK70D) LEFT SIDE



VIDEO IF PRINTED BOARD

TUNER ALIGNMENT INSTRUCTIONS (cont)

UHF IF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
22.	Fig. 201	High side thru adaptor (Fig. 203) to point (V). Low side to chassis.	44MC (10MC Swp)	41.25MC 45.75MC	UHF	Connect 330mmf capacitor in series with a 180Ω resistor from plate of Mixer (V202) to chassis with resistor next to chassis. High side of scope thru demodulator probe to junction of capacitor and resistor. Low side to chassis.	A234, A235	Use only enough sweep generator output to provide a usable pattern on scope. Adjust A234 and A235 for response similar to Fig. 204.
23.	Two 120Ω Carbon Resistors	Across UHF terminals with 120Ω in each lead. Reconnect cable from UHF tuner to VHF tuner Connect separate marker generator loosely to grid of 1st Video IF Amp.(V1).	Tune over entire UHF range	42.5MC 45.0MC 45.75MC	Tune over UHF range	Across Video Det. load.		Use only enough sweep generator output to provide a usable pattern on scope. Check tracking across UHF band if necessary, retouch A234 and A235 for response similar to Fig. 205.

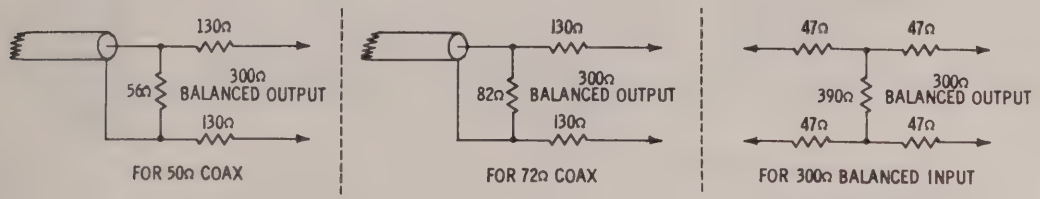


FIG. 201

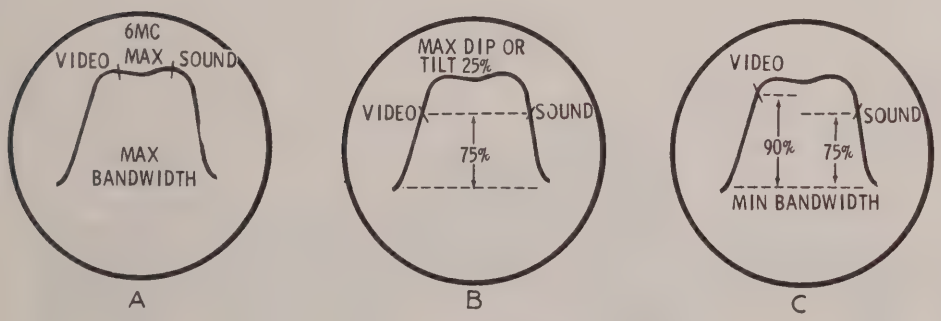


FIG. 202

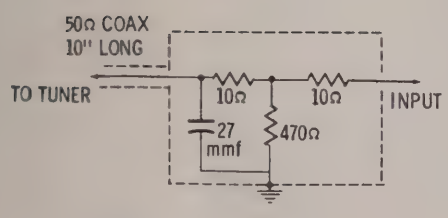


FIG. 203

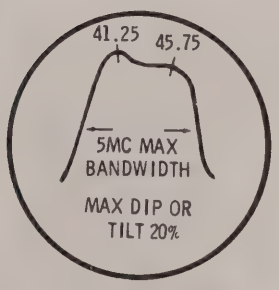


FIG. 204

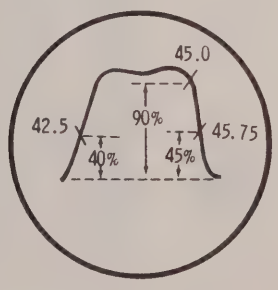


FIG. 205

TUNER PARTS LIST AND DESCRIPTIONS

107016 (KRK 70D)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6CY5	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CQ8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	18		5%	103133		TCZ-18	C10Q18C	CNO-418	5GA-Q18S 5% *	
C202	5		5%	104178	NPO-DI 5		C10V5C	CNO-547	5GA-V5S 5% *	
C203	27		5%	102574		TCZ-27	C10Q27C	CNO-427	5GA-Q27S 5% *	
C204	330			102089	BPD-00033	DD-331	L10T33	JL-333	5GA-T33	
C205	1000			105660	EF-001	MFT-1000			503C-D1	
C206	.5-3			104052		829-3				
C207	1000			105660	EF-001	MFT-1000			503C-D1	
C208	68		5%	104224	NPO-DI 68	DTZ-68	C10Q68	CNO-468	5GA-Q68S 5% *	
C209	330			102089	BPD-00033	DD-331	L10T33	JL-333	5GA-T33	
C210	82		5%	104214		DTZ-82	C10Q82C	CNO-482	5GA-Q82S 5% *	
C211	1000			105660	EF-001	MFT-1000			503C-D1	
C212	2.2		NPO ±.25mmf	106241		TCZ-2R2		CNO-522	5TCCB-V22S ±.25mmf	
C213	.5-3			104052		829-3				
C214	82		10%	106291		DD-820	C10Q82C	CNO-482	5GA-Q82S 10% *	
C215	120		5%	106194	NPO-DI 120	DTZ-120		CNO-312	5GA-T12S 5% *	
C216	82		10%	106291		D8-820	C10Q82C	CNO-482	5GA-Q82S 10% *	
C217	68		N1500 10%	105855						
C218	7		±.5mmf	103523		DTZ-6R8	C10V7C		5GA-V7S ±.5mmf	
C219	10		N330 ±.5mmf	103566						
C220	100		10%	103856		D8-101	C10T1C	CNO-310	5GA-T1S 10% *	
C221	1000			105660	EF-001	MFT-1000			503C-D1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R201	100K			
R202	22K			
R203	8200Ω	2		
R204	2200Ω			

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R205	5600Ω			
R206	2200Ω			
R207	150K			
R208	15K			

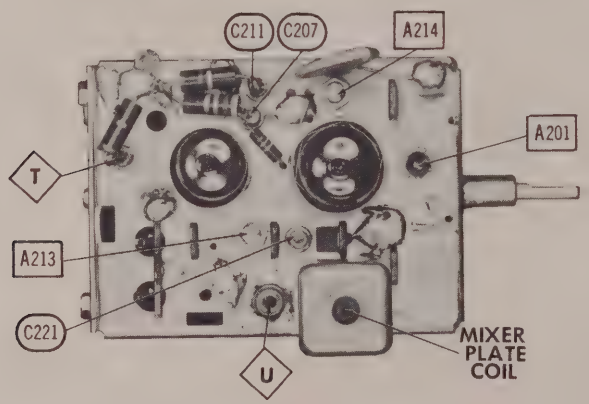
COILS (RF-IF)

ITEM No.	USE	RCA Victor PART No.	NOTES
L201	Ant. Trans.	102576 †	† Part of M201
L202	Ant. Coils	106247	Channels 2-13. Includes wafer assy.
L203	RF Coils	106246	Channels 2-13. Includes wafer assy.

ITEM No.	USE	RCA Victor PART No.	NOTES
L204	Mixer Grid Coils	106245	Channels 2-13. Includes wafer assy.
L205	Osc. Coils	106244	Channels 2-13. Includes wafer assy.
L206	RF Choke	106248	8.2uh
L207A	Mixer Plate	107169	
B	47.25MC Trap		

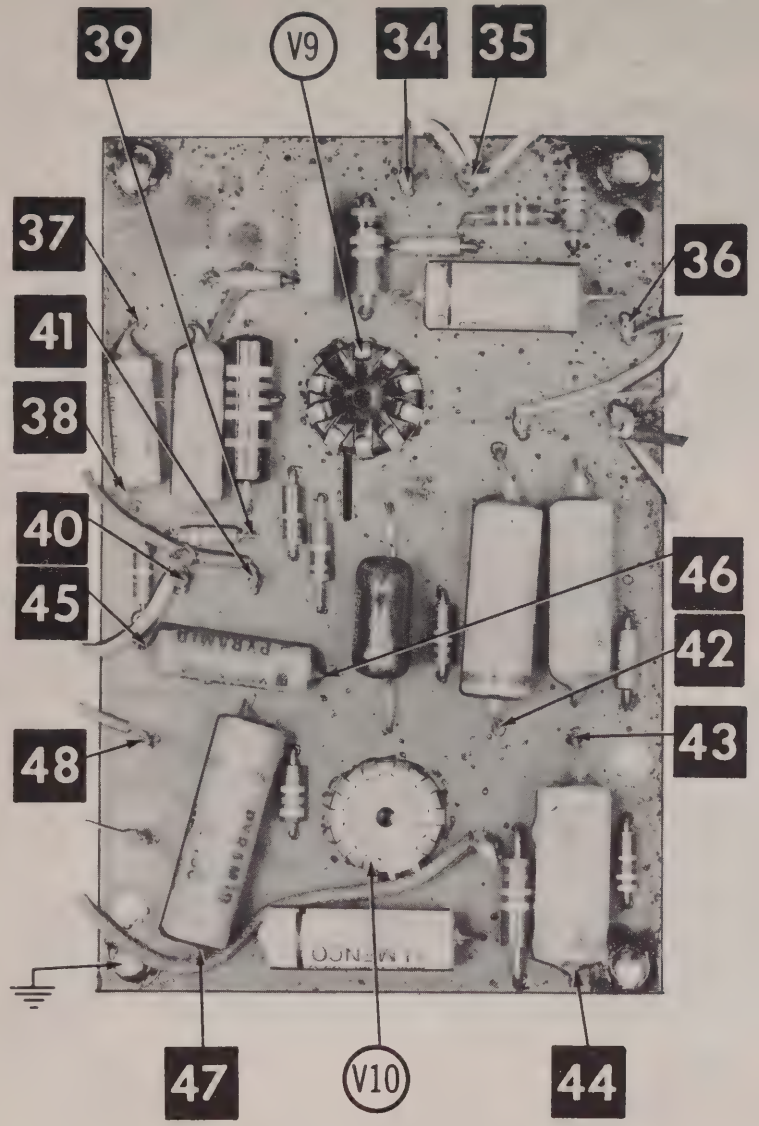
MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M201	Ant. Input Assy.	105924	Includes L201 and traps



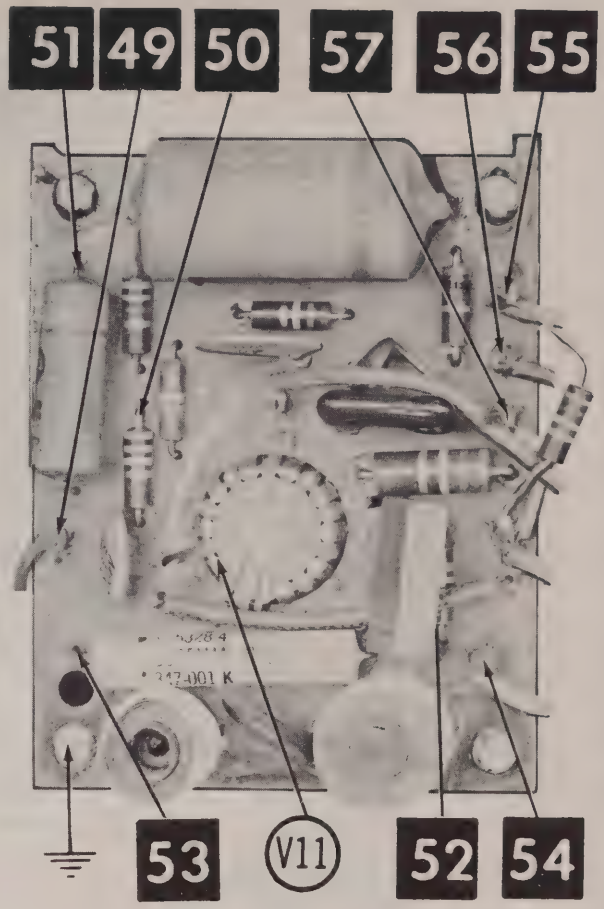
TUNER 107016 (KRK 70D) TOP VIEW

CircuiTrace Numbers 34 thru 48



HORIZ
PRINTED BOARD

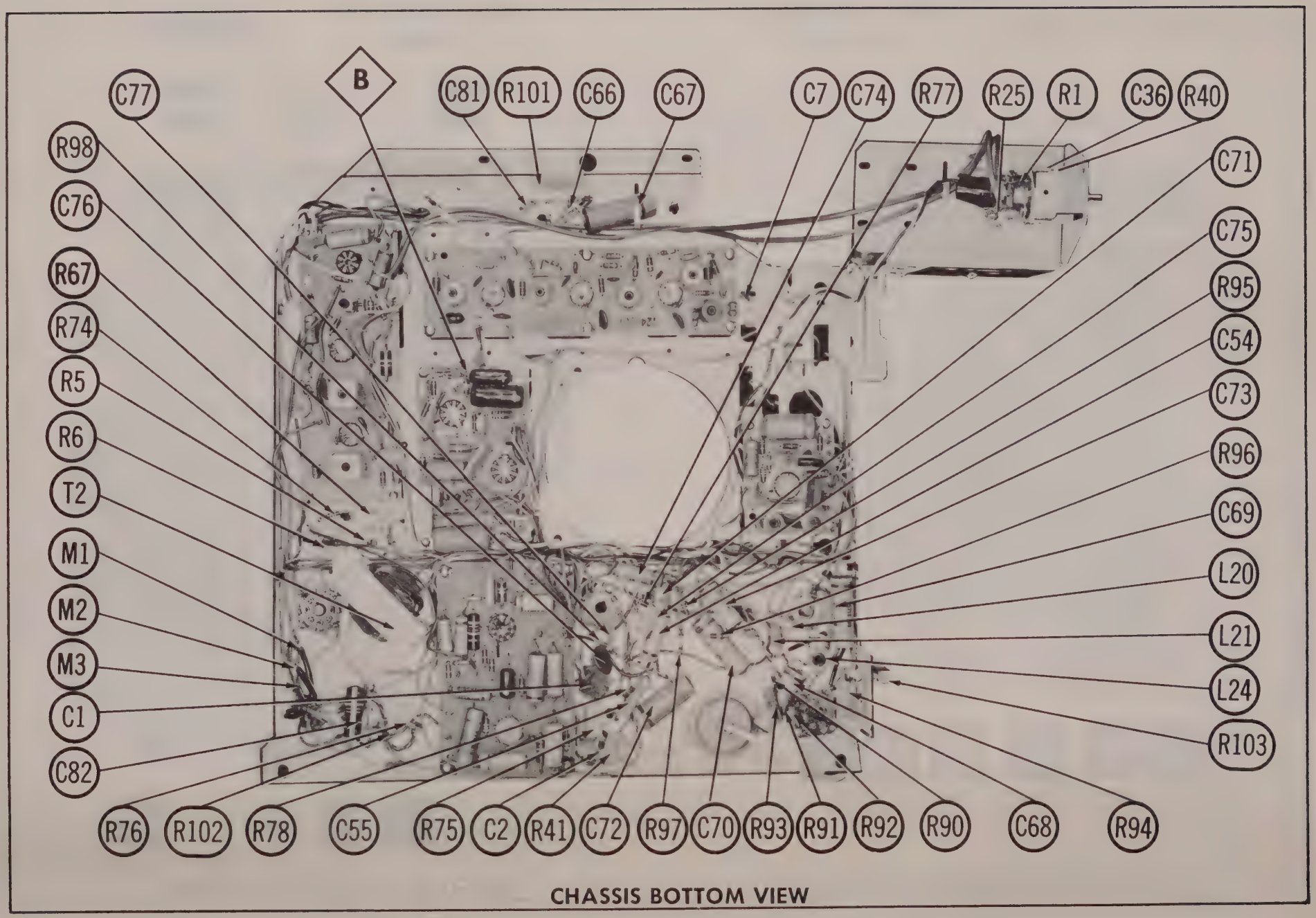
CircuiTrace Numbers 49 thru 57



VERTICAL
PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



CHASSIS BOTTOM VIEW

ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT

Connect the negative lead of a 10 volt bias supply to point Ⓐ. Positive to chassis.
Set Contrast fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru diode probe (Fig. 5) to pin 7 (grid 3) of Audio Detector. Common to chassis.	A7, A8, A9	Adjust for maximum negative voltage. Attenuate generator for a reading between 1.0 and 1.5 volts on meter when finally peaked. Peak A7 and A8 with maximum core separation. Adjust A9 for maximum deflection.

11. Remove VTVM and Diode probe. Connect scope across speaker voice coil. Turn off signal generator and tune in the strongest signal in the area. Adjust Volume control for normal volume. Preset coil slug (A10) flush with top of coil form. While observing scope and listening to sound, adjust A10 clockwise to a peak. Continue turning clockwise for a second louder peak and adjust for maximum on this second peak.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	.01mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (400∿ AM)	Any non-interfering channel	Vert. Amp. thru demodulator probe to pin 7 (cathode) of picture tube. Low side to chassis.	All	Adjust for MINIMUM 400∿ on scope.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 8 & 21

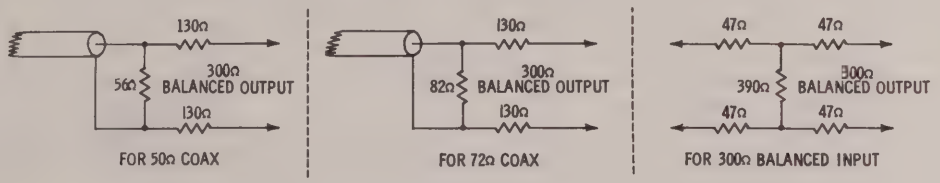


FIG. 4

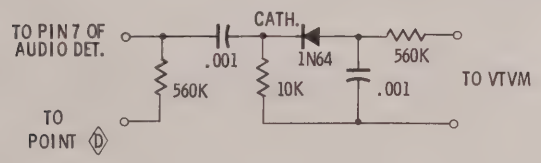
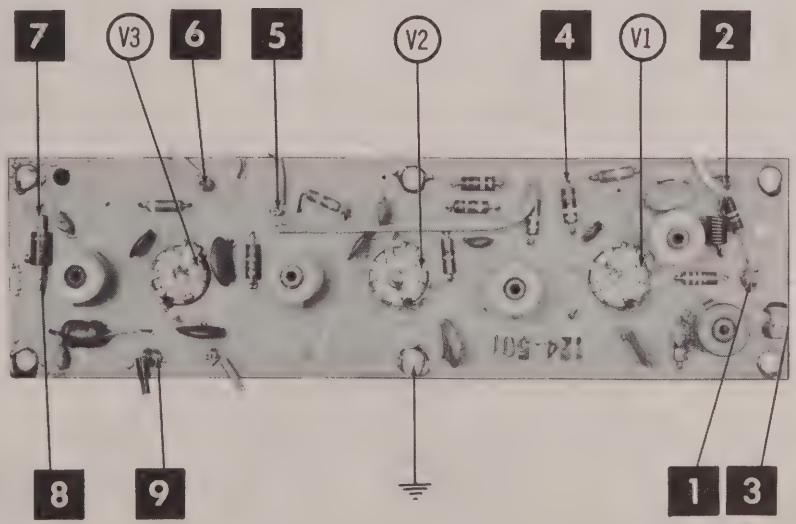


FIG. 5

CIRCUITRACE NUMBERS 1–9



A Howard W. Sams CIRCUITRACE® Photo

VIDEO IF PRINTED BOARD

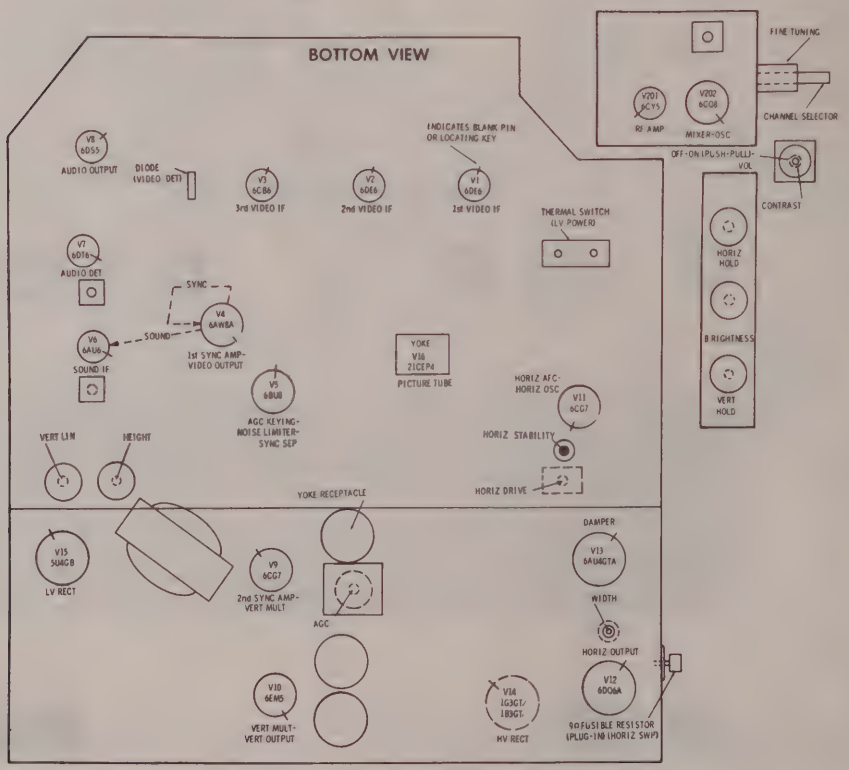
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

RESISTANCE MEASUREMENTS

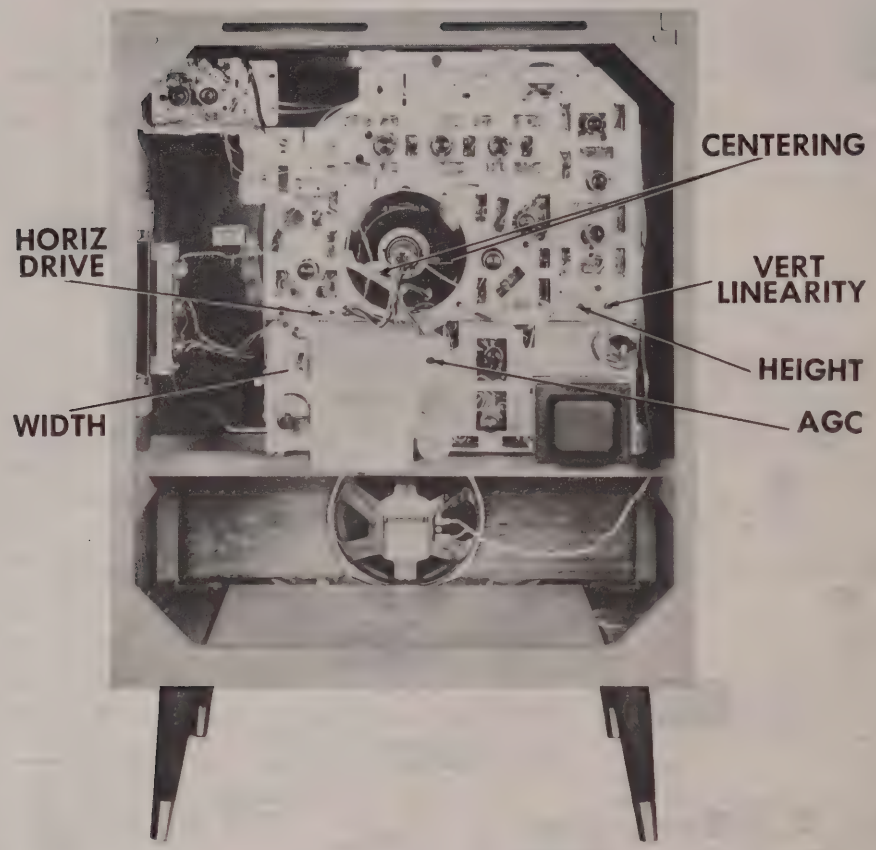
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6DE6	470K	82Ω	0Ω	.1Ω	▲ 680Ω	▲ 680Ω	0Ω		
V2	6DE6	100K	▲ 22Ω	0Ω	.1Ω	† 680Ω	† 680Ω	100K		
V3	6CB6	.1Ω	180Ω	.1Ω	0Ω	† 5200Ω	† 5200Ω	0Ω		
V4	6AW8A	39Ω	2200Ω	† 15K	0Ω	.1Ω	● 170Ω	680K	† 47K	† 6800Ω
V5	6BU8	† 4700Ω	† 8200Ω	2.4meg	0Ω	.1Ω	† 40K	† 4700Ω	† 820K	† 4.2meg
V6	6AU6	47K	0Ω	0Ω	.1Ω	† 5700Ω	† 16K	82Ω		
V7	6DT6	4.2Ω	560Ω	.1Ω	0Ω	‡ 730K	† 15K	470K		
V8	6DS5	0Ω	270Ω	.1Ω	0Ω	† 2200Ω	† 1800Ω	0Ω		
V9	6CG7	† 15K	50K	0Ω	0Ω	.1Ω	● ‡ 1.5meg	2.5meg	0Ω	0Ω
V10	6EM5	† 2200Ω	NC	● 1.7meg	0Ω	.1Ω	● 1.7meg	0Ω	NC	† 690Ω
V11	6CG7	† 0Ω	670K	550K	0Ω	.1Ω	† 68K	70K	65Ω	0Ω
V12	6DQ6A	NC	0Ω	0Ω	† 4700Ω	1meg	TP	.1Ω	100Ω	TOP CAP ‡ 20Ω
V13	6AU4GTA	NC	NC	¶ 550K	NC	† 2.3Ω	NC	0Ω	.1Ω	
V14	1G3GT 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡ 400Ω
V15	5U4GB	NC	¶	NC	18Ω	NC	20Ω	NC	¶	
V16	21CEP4	0Ω	22K	‡ 300K	† 0Ω	NC	22K	● 200K	.1Ω	
V201	6CY5	2.5meg	0Ω	0Ω	.1Ω	† 9000Ω	† 35K	0Ω		
V202	6CQ8	† 3000Ω	165K	INF	0Ω	.1Ω	INF	0Ω	INF	INF
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 260V SOURCE.
▲ MEASURED FROM PIN 7 OF V2.
‡ MEASURED FROM PIN 3 OF V13.

NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Before adjusting Horizontal Stabilizing slug (B1), the Horizontal Drive and Width must be properly adjusted.

Set the Horizontal Hold to the pull-in point. Turn the Width slug (B2) fully counterclockwise and turn Horizontal Drive trimmer (B3) counterclockwise until a bright vertical line appears near the center of the raster, then turn clockwise until the line just disappears. If no line appears, leave B3 fully counterclockwise. With the Brightness set to normal level, adjust the Width slug (B2) for an overscan of approximately 3/4 inch on each side of the screen at normal line voltage. Connect a short jumper across the terminals of the Horizontal Stabilizing coil (L23) and short the grid (pin 2) of the 6CG7 (V11) to chassis with a small screwdriver. Adjust the Horizontal Hold for an upright picture (may appear to float back and forth across the screen). Remove the jumper from L23 and adjust B1 to again obtain a picture in an upright position. When B1 is properly adjusted, alternately shorting and removing short should not cause the picture to lose sync but instead cause a slight sideways shift of the picture. Remove the short from the grid of the 6CG7.

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

TRAV-LER MODELS 821-FT-900, U, 821-K-909, U,
821-K-910, U, 821-T-901, U, 821-T-905, U,
921-K-910, U, 921-T-901, U (Ch. 1051-19)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

TRAV-LER MODELS 821-FT-900, U, 821-K-909, U,
821-K-910, U, 821-T-901, U, 821-T-905, U,
921-K-910, U, 921-T-901, U (Ch. 1051-19)

TRAV-LER MODELS 821-FT-900, U, 821-K-909, U,
821-K-910, U, 821-T-901, U, 821-T-905, U,
921-K-910, U, 921-T-901, U (Ch. 1051-19)

MODEL 821-T-901 (CH. 1051-19)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

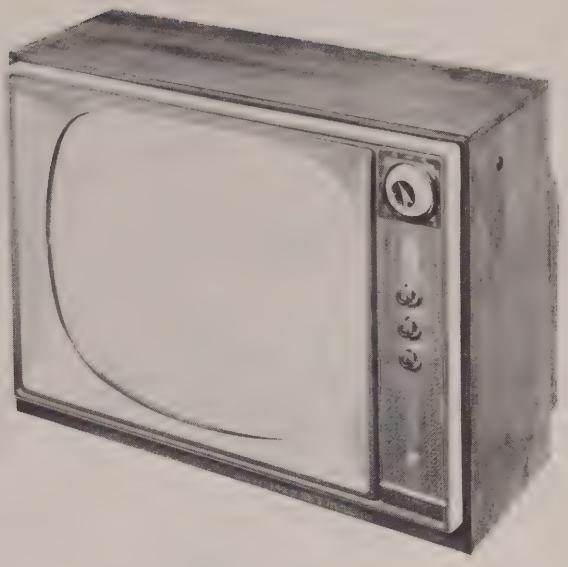
PHOTOFACT* Folder

TRAV-LER MODELS 821-FT-900, U, 821-K-909, U, 821-K-910, U, 821-T-901, U, 821-T-905, U, 921-K-910, U, 921-T-901, U (Ch. 1051-19)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 821-T-901

1. Remove 11 wood screws holding rear cover. Remove antenna connections. Remove rear cover.
2. Remove 6 push-on type knobs from the front.
3. Remove speaker leads, yoke plug, picture tube socket, and Hi-Voltage lead.
4. Remove 4 metal screws holding front control panel. Remove front control panel from the cabinet.
5. Remove pilot light.
6. Remove 6 chassis bolts from the bottom of the cabinet.
7. Remove the chassis.



MODEL 821-T-901 (CH. 1051-19)

TRADE NAME	Trav-Ler	MODELS	CHASSIS
		821-FT-900, U, 821-K-909, U, 821-K-910, U, 821-T-901, U, 821-T-905, U, 921-K-910, U, 921-T-901, U	1051-19
MANUFACTURER	Trav-Ler Radio & Tele. Corp., 571 West Jackson Blvd., Chicago 6, Illinois		
TYPE SET	Television Receiver		
TUBES	VHF-Seventeen, UHF-Eighteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 195 Watts, 1.9 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

For picture tube, and safety glass cleaning, it is necessary to remove the chassis. (See "Disassembly Instructions".)

FUSE

One fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)
One fuse wire is used for filament protection. (For location, see M3 in photo "Chassis Bottom View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove the plug button located on the upper right side of the cabinet.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Cabinet-Rear View".)

SYNC STABILITY

Sync stability may be varied by means of a Range control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

CENTERING

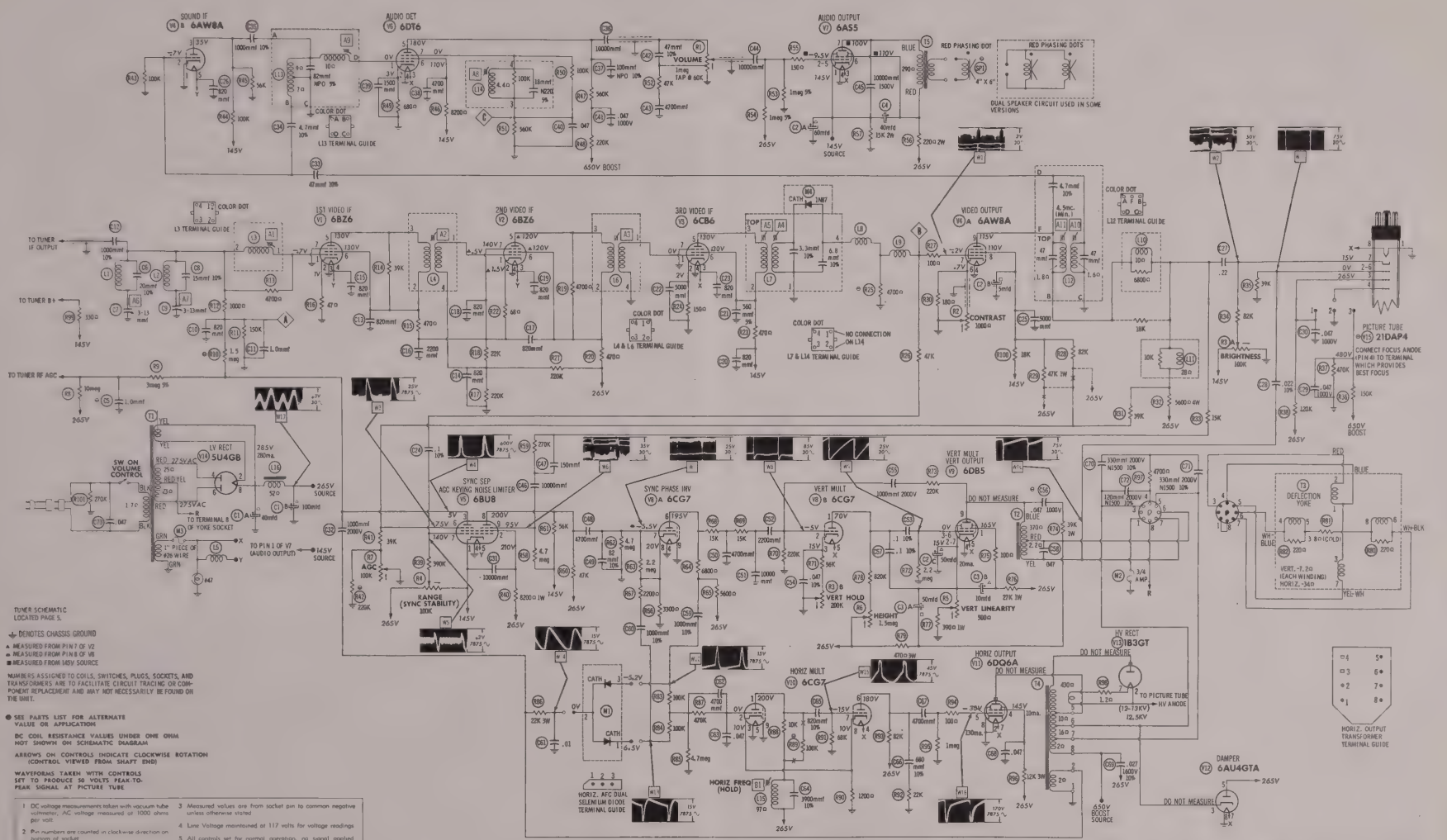
Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

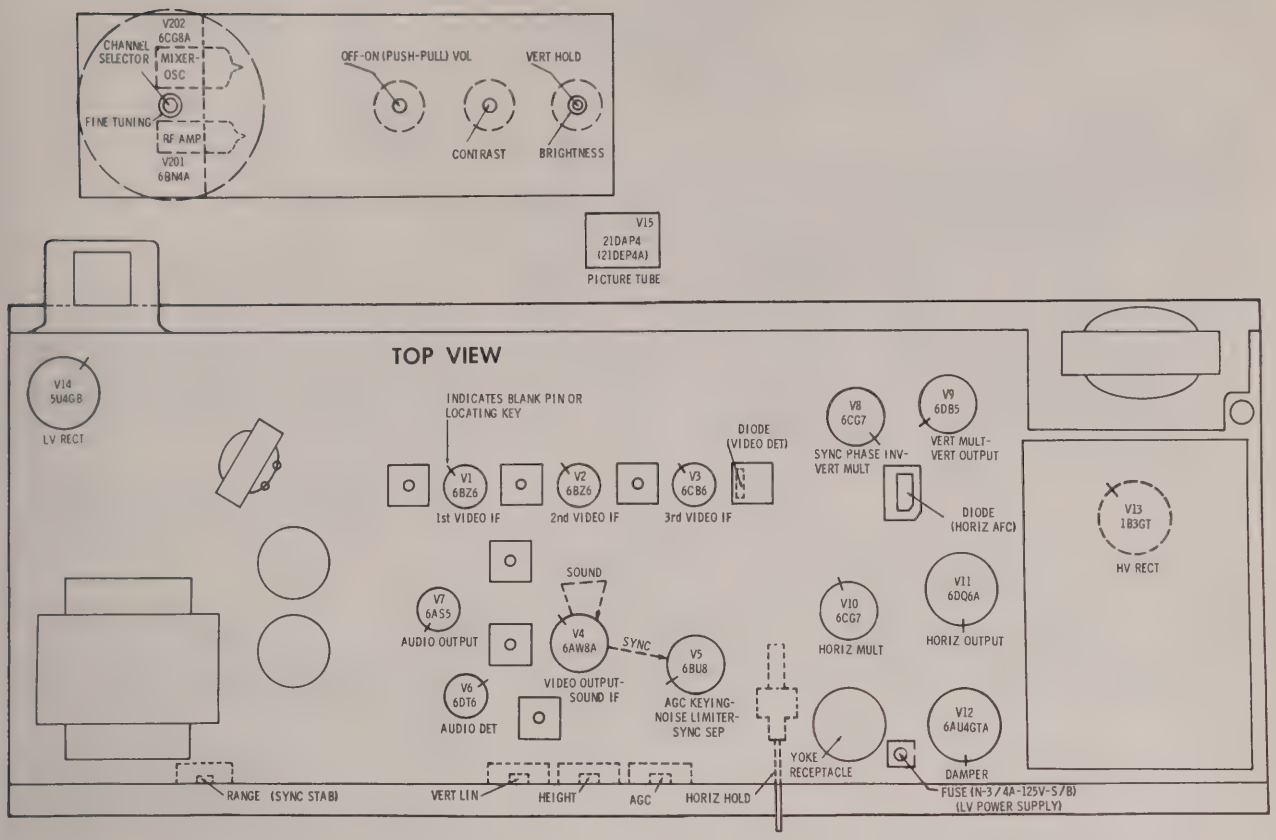
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JA417

SET 453 FOLDER 2


SOUND IF V4 B 6AW8A
AUDIO DET V5 6DT6
AUDIO OUTPUT V7 6AS5
VOLUME
RED PHASING DOT
DUAL SPEAKER CIRCUIT USED IN SOME VERSIONS
COLOR DOT
L13 TERMINAL GUIDE
650V BOOST
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3 6CB6
VIDEO OUTPUT V4 A 6AW8A
L12 TERMINAL GUIDE
L4 & L6 TERMINAL GUIDE
L7 & L14 TERMINAL GUIDE
NO CONNECTION ON L14
CONTRAST
BRIGHTNESS
PICTURE TUBE 21DAP4
CONNECT FOCUS ANODE (PIN 4) TO TERMINAL WHICH PROVIDES BEST FOCUS
TO TUNER IF OUTPUT
TO TUNER B+
TO TUNER RF AGC
LV RECT V14 5U4GB
SW ON VOLUME CONTROL
TO PIN 1 OF V7 (AUDIO OUTPUT)
SYNC SEP AGC KEYING NOISE LIMITER V5 6BU8
SYNC PHASE INV V8 A 6CG7
VERT MULT V8 B 6CG7
VERT MULT VERT OUTPUT V9 6DB5
DO NOT MEASURE
AGC
RANGE (SYNC STABILITY)
VERT HOLD
HEIGHT
VERT LINEARITY
DEFLECTION YOKE
VERT.-7.2Ω (EACH WINDING) HORIZ.-3Ω
HV RECT V13 1B3GT
HORIZ OUTPUT V11 6DQ6A
TO PICTURE TUBE HV ANODE (12-13KV) 12.5KV
HORIZ MULT V10 6CG7
HORIZ FREQ (HOLD)
HORIZ. AFC DUAL SELENIUM DIODE TERMINAL GUIDE
HORIZ. OUTPUT TRANSFORMER TERMINAL GUIDE
DAMPER 6AU4GTA
650V BOOST SOURCE
TUNER SCHEMATIC LOCATED PAGE 5.
DENOTES CHASSIS GROUND
▲ MEASURED FROM PIN 7 OF V2
▲ MEASURED FROM PIN 8 OF V8
■ MEASURED FROM 145V SOURCE
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAR SIGNAL AT PICTURE TUBE
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clock-wise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W Sams & Co, Inc. 1959
TRAV-LER MODELS 821-FT-900, U, 821-K-909, U, 821-K-910, U, 821-T-901, U, 821-T-905, U, 921-K-910, U, 921-T-901, U (Ch. 1051-19)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (B+), V14, Fuse Wire (Fil.)

SWEEP FAILURE
No raster, has sound V10, V11, V12, V13, V14, V15, Diode (Horiz. AFC)
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V14, V10, V11, V12
Vert. off freq. V8, V9
Horiz. off freq. V10, Diode (Horiz. AFC)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V5, V8
No horiz. sync V5, V8, Diode (Horiz. AFC), V10
No vert. or horiz. sync V5, V8

TRAV-LER MODELS 821-FT-900, U, 821-K-909, U, 821-K-910, U, 821-T-901, U, 821-T-905, U, 921-K-910, U, 921-T-901, U (Ch. 1051-19)

FOLDER 2

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:
A1 thru A5, A8 thru A11 ... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A6, A7 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
Mixer Plate Coil ..... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Set Contrast fully clockwise and AGC fully counterclockwise.
Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44.0MC (10MC Swp)	41.25MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to point (B). Low side to chassis. (Across Video Det. load)	A1, A2, A3, A4, A5, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Adjust Mixer Plate Coil and A2 to place 45.75MC marker at 50% on curve, A1 and A3 to correct low frequency side of curve, A4 for MINIMUM dip and A5 for proper tilt.
2.	"	"	"	41.25MC 47.25MC	"	"	A6, A7	Adjust A6 to place 41.25MC marker in proper trap notch. Adjust A7 to place 47.25MC marker in other trap notch.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	.05mfd	High side to point (B). Low side to chassis.	4.5MC (15KC Swp)	Any non-interfering channel	Across voice coil. Connect DC probe of VTVM to point (C). Common to chassis.	A8	Use high signal input. Set Volume for audible level. Adjust A8 for maximum audio on scope. If two peaks occur, select the one giving the highest meter readings.
4.	"	"	"	"	"	A9, A10	Reduce the signal level to the point where the audio on the scope starts to break up. Adjust A9 and A10 for cleanest maximum audio output on scope. Reduce the signal level still farther retouch A9 and A10 for cleanest maximum audio on scope.

SOUND IF ALIGNMENT USING AIR SIGNAL AND VTVM

Set the Contrast fully clockwise and tune in an air signal.
Connect the positive lead of the VTVM to point (C); negative lead to chassis.
Preset A8 fully counterclockwise. Next turn A8 clockwise until a peak is obtained on the meter. The point of maximum undistorted sound as judged by listening, will occur slightly past this peak and will be between 2.5 and 3.5 volts on the meter. Tune A8 for maximum undistorted sound and not peak voltage. Reduce the signal by disconnecting the antenna or detuning the Fine Tuning until the sound is distorted. Adjust A9 and A10 for maximum undistorted sound. Further reduce the sound and retouch A9 and A10. Continue reducing the signal and retouching A9 and A10 until optimum results are obtained. It may be necessary in some cases to retouch A8 for MINIMUM buzz at strong signal levels and A10 for cleanest sound at weak signal levels.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.05mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru diode det. (Fig. 2) to pin 7 (cathode) of picture tube. Common to chassis.	All	Adjust for MINIMUM deflection.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

FIG.1

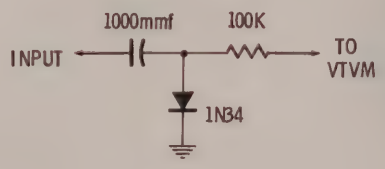


FIG.2

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1959

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A212 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A213, A214, A215..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Set the Fine Tuning to the center of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

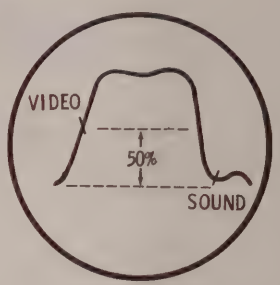


FIG. 201

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Connect the negative lead of a 4.5 volt bias supply to point (T). Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (U). Low side to chassis.	A213, A214, A215	Adjust A213 and A214 for maximum amplitude and symmetry with markers as shown in Fig. 202. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A215 to obtain MINIMUM response on the scope. Restore bias.
3.	"	"	213MC	211.25MC 215.75MC	13	"	A216	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by compressing or expanding coil turns.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

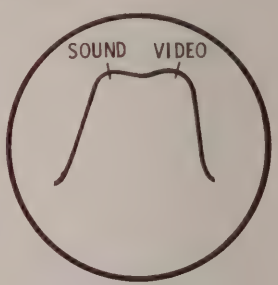
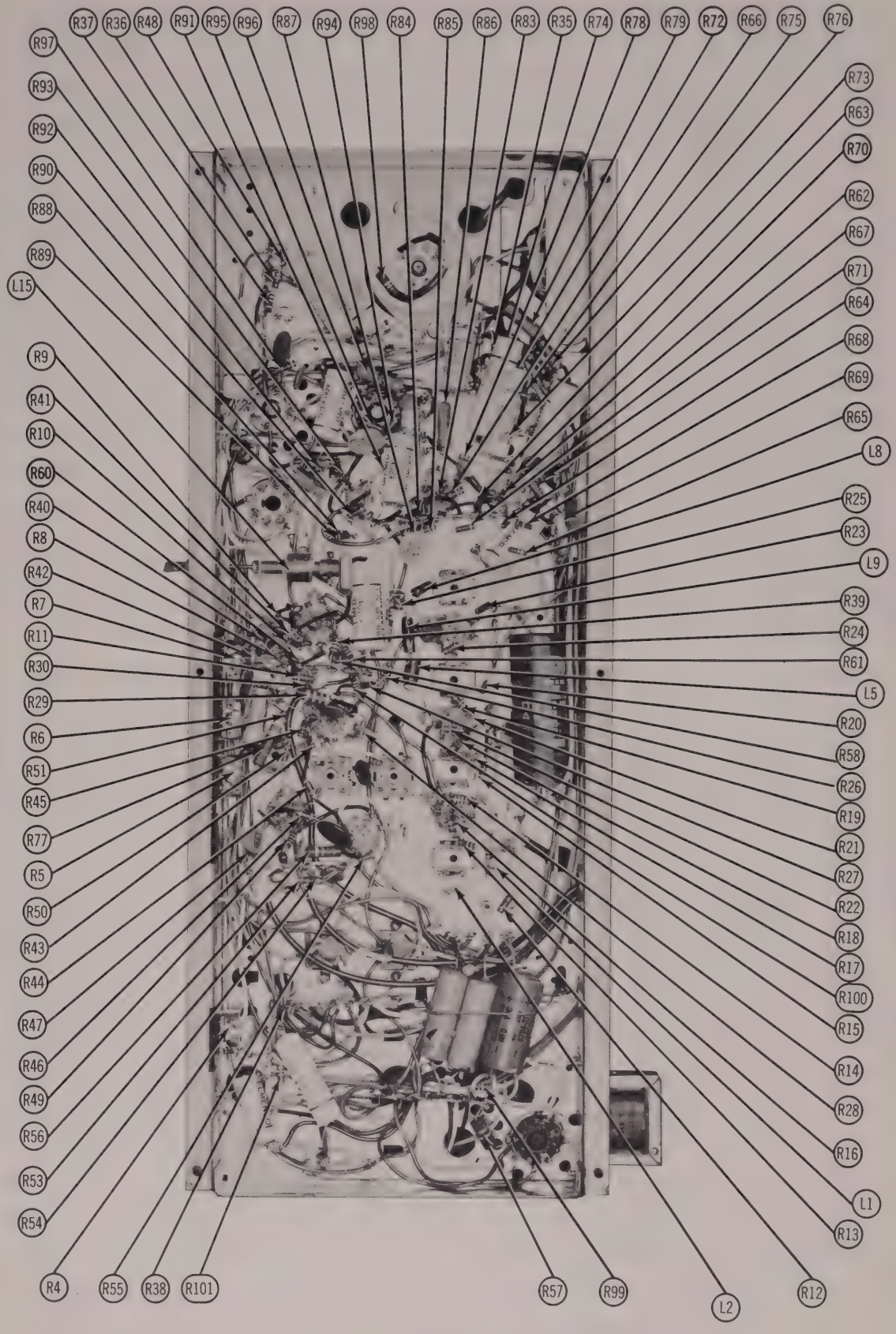


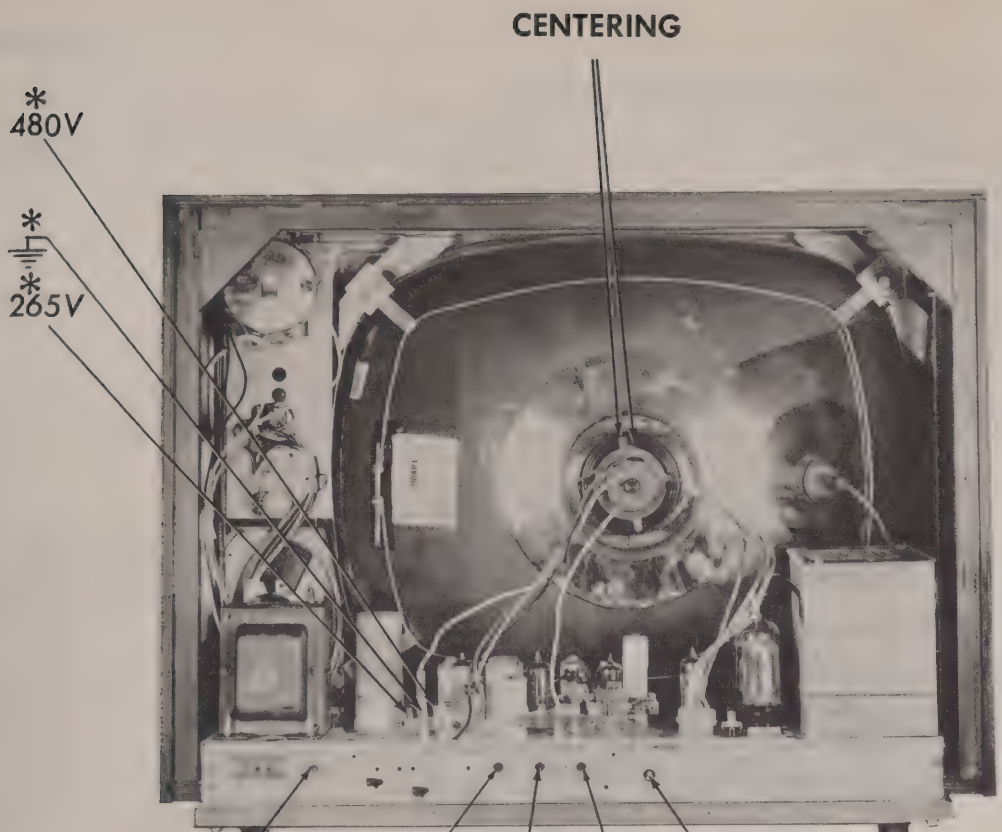
FIG. 202

CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

821-T-905, U, 921-K-910, U, 921-T-901, U (Ch. 1051-19)



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast controls for a normal picture.

Turn the Horizontal Frequency Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Frequency Hold slowly counterclockwise until the picture just falls into sync.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp.	6BZ6	
V2	2nd Video IF Amp.	6BZ6	
V3	3rd Video IF Amp	6CB6	
V4	Video Output-Sound IF Amp.	6AW8A	
V5	AGC Keying-Noise Limiter-Sync Sep	6BU8	
V6	Audio Det.	6DT6	
V7	Audio Output	6AS5	

ITEM No.	USE	TYPE	NOTES
V8	Sync Phase Inv.-Vert. Mult	6CG7	
V9	Vert Mult.-Vert. Output	6DB5	
V10	Horiz. Mult.	6CG7	
V11	Horiz. Output	6DQ6A	
V12	Damper	6AU4GTA	
V13	HV Rect.	1B3GT	
V14	LV Rect.	5U4GB	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	TRAV-LER PART No	GENERAL ELECTRIC PART No	RCA PART No	SYLVANIA PART No	
V15	21DAP4 21DEP4A	21DEP4 ① 21DEP4 ①	21DAP4 ① 21DEP4-A ①	21DAP4 ② 21DEP4 ② 21DEP4A ②	① Aluminized ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA							
	CAP.	VOLT	TRAV-LER PART No	AEROVOX PART No.	CORNELL-DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SPRAGUE PART No.	NOTES
C1A	≈40	350	EC-115	AFH2-64-25	B0483	FP247	TMD-91	TVL-2780	
B	≈100	350							
C2A	≈60	200	EC-114	AFH4-46-10	D0676	FP419.11	TMQ-161	TVL-4709	
B	≈5	200							
C	≈50	50							
C3A	≈50	350	EC-116	AFH3-38-30	C0235	FP330.7	TMT-16	TVL-3639.5	
B	≈10	350							
C4	40	200	EC-113	PR8250V40	BR4025	TC58	TD-40-350	TVA-1511	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	1.0	100		PC-89	P288N-1.0		CUB2W1	GEM-21	2TM-M1	①
C6	20		10%	CC-124	NPO-21 20	TCZ-20	C10Q2C	ZT-542	MS-42	
C7	3-13			TC-25						
C8	15		10%	CC-125	NPO-21 15	TCZ-15	C10Q15C	CNO-415	MS-15	
C9	3-13			TC-25						
C10	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C11	1.0			PC-89	P288N-1.0		CUB2W1	GEM-21	2TM-M1	
C12	1000		10%	CC-37	DI-1000		1R5D1	JL-210	MS-21	
C13	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C14	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C15	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C16	2200			CC-123	BPD-0022	DD-222	BYA10D22	B-322	5HK-D22	
C17	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C18	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C19	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C20	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C21	560		5%	CC-126			1R5T56		MS-356	
C22	5000			CC-3	BPD-008	DD-502	BYA10D5	B-350	5HK-D5	
C23	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C24	.1		600 10%	PC-78C	V84C6P1		PM6P1	GTM-601	6TM-P1	
C25	5000			CC-3	BPD-008	DD-502	BYA10D5	B-350	5HK-D5	
C26	820			CC-96	BPD-0008	DD-821	L10T82	B-382	5GA-T82	
C27	.22		400	PC-39C	P488N-22		CUP4P22	GEM-4022	4TM-P22	
C28	.022		600 10%	PC-45C	V84C9822		PM6S22	GTM-6122	6TM-S22	
C29	.047		1000	PC-86C	P1088N-047		CUB10S47	GEM-10147	10TM-S47	
C30	.047		1000	PC-86C	P1088N-047		CUB10S47	GEM-10147	10TM-S47	
C31	10000			CC-82	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C32	1000		2000	CC-96	HVD-30-1000	DD30-102	HVB20D1	2HV-210	20GA-D1	
C33	47		10%	CC-13	DI-47	DD-470	C10Q47C	CNO-447	MS-447	
C34	4.7		10%	CC-15	NPO-21 4.7	TCZ-4R7	C10V47C	ZT-5547	MS-55	
C35	1000		10%	CC-37	DI-1000		1R5D1	JL-210	MS-21	
C36	10000			CC-82	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C37	100		NPO 10%	CC-73	NPO-21 100	TCZ-100	C10T1C	ZT-531	5TCC-T1S 10% *	
C38	4700			CC-99	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C39	1500			CC-127	BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C40	.047		200	PC-36C	P288N-047	DF-503	CUB2S47	GEM-6147	6TM-S47	
C41	.047		1000	PC-86C	P1088N-047		CUB10S47	GEM-10147	10TM-S47	
C42	47		10%	CC-13	DI-47	DD-470	L10Q47	CNO-447	MS-447	
C43	4700			CC-99	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C44	10000			CC-82	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C45	10000		1500	CC-121	DAC-27	DD-103	HVE16S1	2HV-110	20HKB-S1	
C46	10000			CC-81	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C47	150			CC-120	DI-150	DD-151	L10T15	B-315	5GA-T15	
C48	4700			CC-99	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C49	82		10%	CC-130	DI-82	DD-820	L10Q82	CNO-482	MS-482	
C50	4700			CC-99	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C51	10000			CC-81	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C52	2200			CC-123	BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	
C53	.1		600 10%	PC-78C	V84C6P1		PM6P1	GTM-601	6TM-P1	
C54	.047		600 10%	PC-45C	V84C9847		PM6S47	GTM-6147	6TM-S47	
C55	1000		2000	CC-96	HVD-30-1000	DD30-102	HVB20D1	2HV-210	20GA-T1	
C56	.047		1000	PC-86C	P1088N-047		CUB10S47	GEM-10147	10TM-S47	②
C57	.1		600 10%	PC-78C	V84C6P1		PM6P1	GTM-601	6TM-P1	
C58	.047		600 10%	PC-40C	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C59	1000		10%	CC-37	DI-1000		1R5D1	JL-210	MS-21	
C60	1000		10%	CC-37	DI-1000		1R5D1	JL-210	MS-21	
C61	.01		600 10%	PC-15C	P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C62	4700			CC-99	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C63	.047		600	PC-40C	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C64	3900		10%	MC-14	1464-0039		1R5D39	MCB463	MS-239	
C65	330		10%	MC-33	1469-00052		1R5T33	MCB251	MS-333	
C66	680		10%	MC-31	1469-00068	D6-681	1R5T68		MS-368	
C67	4700			CC-99	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C68	.047		600	PC-40C	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C69	.027		1500 10%	PC-86C						
C70	330		2000 N1500 10%	CC-119						
C71	330		2000 N1500 10%	CC-119						
C72	120		2000 N1500 10%	CC-118						
C73	.047		600	PC-40C	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use .22mfd ④ 200V in this application (Part #PC-35C).
② Some versions may use 1000mmf ④ 2000V in this application (Part #CC-88).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRAV-LER PART No	CENTRALAB PART No	CLAROSTAT PART No.	IRC PART No	MALLORY PART No	
R1A	1meg	½	VC-173				PP16A	Volume, Tap a 60K
B	Switch						Not Req.	Push-Pull Off-On
R2A	1000Ω	½	VC-178	B-508	A47-1000-8	QAT-108	U9	Contrast
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	100K	½	VC-174	F1-31		●(QAT-1113	●(	Brightness
B	200K	½		R2-33				Vert. Hold
R4A	100K	½	VC-177	AB-40	B47-100K-8	BU1-128	PTA15L	Range (Sync Stability)
B	Shaft			AK-19	Not Req.	TM-1	Not Req.	
R5A	500Ω	½	VC-176	AB-4	B47-500-8	BU1-103	PTA52L	Vert. Lin.
B	Shaft			AK-19	Not Req.	TM-1	Not Req.	
R6A	1.5meg	½	VC-175	AB-742	B47-1.5meg-8	BU1-158	TA16L	Height
B	Shaft			AK-19	Not Req.	TM-1	Not Req.	
R7A	100K	½	VC-177	AB-40	B47-100K-8	BU1-128	PTA15L	AGC
B	Shaft			AK-19	Not Req.	TM-1	Not Req.	

●"Concentrikit" Equivalent: K-2 Kit with Base Elements & Shafts: BU1-128, P1-204 (Panel) BU1-129, RI-220 (Rear)

●"STA-LOC" Equivalent: FA15L, RU25L, OF2125, HC2625.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		TRAV-LER PART No.	NOTES
	OHMS	WATT		
R8	10meg		IR-151	
R9	3meg 5%		IR-279	
R10	1.5meg			Note 1
R11	150K		IR-95	
R12	1000Ω		IR-112	
R13	4700Ω		IR-48	
R14	39K		IR-121	
R15	470Ω		IR-5	
R16	47Ω		IR-97	
R17	220K		IR-91	
R18	22K		IR-45	
R19	4700Ω		IR-48	
R20	470Ω		IR-5	
R21	220K		IR-91	
R22	68Ω		IR-59	
R23	470Ω		IR-5	
R24	150Ω		IR-98	
R25	4700Ω		IR-48	Note 2
R26	47K		IR-46	
R27	100Ω		IR-104	
R28	82K		IR-31	
R29	47K	1	IR-120	
R30	180Ω		IR-133	
R31	39K		IR-121	
R32	5600Ω	4	IR-273	
R33	15K		IR-53	
R34	82K		IR-31	
R35	39K		IR-121	
R36	150K		IR-95	
R37	470K		IR-110	
R38	120K		IR-144	
R39	390K		IR-117	
R40	8200Ω	1	IR-255	
R41	39K		IR-121	
R42	220K		IR-91	Note 3
R43	100K		IR-43	
R44	100K		IR-43	
R45	56K		IR-100	
R46	8200Ω		IR-60	
R47	560K		IR-136	
R48	220K		IR-91	
R49	680Ω		IR-135	
R50	100K		IR-43	
R51	560K		IR-136	
R52	47K		IR-46	
R53	1meg 5%		IR-74	
R54	1meg 5%		IR-74	

ITEM No.	RATING		TRAV-LER PART No.	NOTES
	OHMS	WATT		
R55	150Ω		IR-98	
R56	220Ω	2	IR-272	
R57	15K	2	IR-88	
R58	4.7meg		IR-277	
R59	270K		IR-140	
R60	47K		IR-46	
R61	56K		IR-100	
R62	4.7meg		IR-277	
R63	2.2meg		IR-163	
R64	6800Ω		IR-78	
R65	5600Ω		IR-53	
R66	3300Ω		IR-108	
R67	2200Ω		IR-67	
R68	15K		IR-53	
R69	15K		IR-53	
R70	220K		IR-91	
R71	56K		IR-100	
R72	2.2meg		IR-163	
R73	220K		IR-91	
R74	39K	1	IR-77	
R75	100Ω		IR-104	
R76	27K	1	IR-103	
R77	390Ω	1	IR-55	
R78	820K		IR-116	
R79	470Ω	3	IR-271	
R80	220Ω		IR-5	
R81	3.8Ω Cold		IR-284	
R82	220Ω		IR-5	
R83	100K		IR-43	
R84	100K		IR-43	
R85	4.7meg		IR-277	
R86	22K	3	IR-276	
R87	470K		IR-110	
R88	10K		IR-54	
R89	100K		IR-43	Note 4
R90	1200Ω		IR-34	
R91	68K		IR-51	
R92	22K		IR-45	
R93	82K		IR-31	
R94	100Ω		IR-104	
R95	1meg		IR-105	
R96	12K	3	IR-275	
R97	4700Ω		IR-48	
R98	1.2Ω		IR-274	
R99	330Ω		IR-189	
R100	18K		IR-99	
R101	270K		IR-140	

Note 1. Some versions may use 2.2meg in this application (Part #IR-163).
Note 2. Some versions may use 6800Ω in this application (Part #IR-78).
Note 3. Some versions may use 56K in this application (Part #IR-100).
Note 4. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		TRAV-LER PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	41.25MC Trap Coil	L-161-1						
L2	47.25MC Trap Coil	L-161						
L3	1st Video IF	L-150				6231 †		
L4	2nd Video IF	L-151	17-5004	17-5004	TV-126	6234		
L5	Fil. Choke	L-164	19-1001	19-1001	BC-562	6804		1.0uh
L6	3rd Video IF	L-151	17-5004	17-5004	TV-126	6234		
L7	4th Video IF	L-152						
L8	RF Choke	L-160	19-1006	19-1006	BC-566	6812		10.4uh
L9	RF Choke	L-158						27.5uh
L10	Series Peaking Coil	L-162						③
L11	Shunt Peaking Coil	L-163						③
L12	1st Sound IF	L-154						③
L13	2nd Sound IF	L-155						③
L14	Quadrature Coil	L-110A	17-1031 *	17-1031 *		1481 *	SD-5*	

* Parallel with 100K resistor. ① Wound on 6800Ω resistor. ② Wound on 10K resistor. ③ Pri. tapped ② 7Ω.
† Diaregard secondary.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L15	97Ω		L-156	HS-5 *	TV-163 *	6210 *	H-102 *	HS-5	Horiz. Osc. * Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ^)	TRAV-LER PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
L16	280A	52Ω	1Hy	FC-16	25C44	C-2996	F-801	C-2328	20C44	C-27X

TRANSFORMER (POWER)

ITEM No	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	TRAV-LER PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	117V ④ 1.9A	550VCT .5 .280A	5V ④ 3A	TR-52A						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ④ 9.2A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T2	Vert. Output	TR-50A	26S14		V319			26S14	A-113X ①
T3	Yoke-Horiz. (18.5MH) (110°)-Vert. (13.8MH)	L-149	Y-46 ② ③		Y-110 ②①		DY-27A ②②	Y-48 ② ②	Y-60 & NW-9 & YC-110 ②
	Rear Cover & Centering Device	MP-136							
	Yoke Clamp	ST-58							
T4	Horiz. Output	TR-51	FLY-137 *		X-162 *	EFR-172*	HO-304 *	FLY-137 *	D-151R*

① Connect as autoformer.
② Use original yoke damping networks. Require new rear cover, centering device, and yoke clamping device.
③ Connect same as original.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	5	5		5	5	5	5	5
	6	6		6	4	6	6	6
	7	7		7	2	7	7	7
	8	8		8	1	8	8	8
	2	1		1	7	2	1	2
	1	2		2	8	1	2	1
Special Notes →		④		⑤		④		

④ If AGC does not function properly, reverse connections to terminals #1 and #2.
⑤ Filament requires one turn only.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	4700Ω	3-4Ω	AT-50	24S48	A-3026	AU-801	A-3877	24S48	S-5X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRAV-LER PART No.	QUAM PART No.	
SP1	4" x 6"	PM	3-4Ω	SPK-84 ①	46A1	① Models 821-FT-900, U, 821-T-901, U, 821-T-905, U
	5"	PM	3-4Ω	SPK-36 ②	5A07	② Models 821-K-909, U, 821-K-910, U

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT (Measured)	TRAV-LER PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.		
M1		SR-15 ①	K1615 ①	SD-91 ②				① Selenium Type. ② Silicon Type (2 used).

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			TRAV-LER PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	N	3/4A 125V	F-13	F-14	333.750 (N-3/4A-125V)	346010	N 3/4	HN 1/2 to 3/4
M3	1" #26 Wire							

TRAV-LER MODELS 821-FT-900, U, 821-K-909, U, 821-K-910, U, 821-T-901, U, 821-T-905, U, 921-K-910, U, 921-T-901, U (CH. 1031-19)

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		TRAV-LER PART No.	CBS PART No.	SYLVANIA PART No.	
M4	1N87	SC-23	1N60	1N60	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M5	Tuner Tuner	TA-51 TA-51U	VHF VHF-UHF Provisions

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	DW-96	
Mask	MP-135	
Knob	K-336	Channel Selector
Knob	K-337	Fine Tuning
Knob	K-340	Off-On-Volume, Contrast
Knob	K-338	Brightness
Knob	K-339	Vert. Hold
Cabinet	CA-332F	Fabric, Model 821-FT-900
Cabinet	CA-332M	Mahogany, Models 821-T-901, U, 821-T-905, U
Cabinet	CA-332B	Blond, Models 821-T-901, U, 821-T-905, U
Cabinet	CA-334M	Mahogany, Models 821-K-909, U, 821-K-910, U
Cabinet	CA-333B	Blond, Models 821-K-909, U, 821-K-910, U
Leg	CH-100M	Mahogany, Models 821-K-909, U, 821-K-910, U
Leg	CH-100B	Blond, Models 821-K-909, U, 821-K-910, U

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TUNER PARTS LIST AND DESCRIPTIONS

TA-51,U

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BN4A	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CG8A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120		N3300 10%	13L-031						
C202	30			13M350U300N-02						
C203A	15		N150 7%	13L8PG150N2						
B	15		N150 7%							
C204	1000			13M350EA102Z-01	EF-001	MFT-1000			503C-D1	
C205	.27		10%	13D-111-45						
C206	2-6			31B-902-01		829-6		CT552		
C207	2-10			31B-902-09		829-10				
C208	47			13M320U470J-09	EF-00005	MFT-50				
C209	4.7		N220 ±.25mmf	13L8R4R7C						
C210	1000			13LX102Z	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C211	13		N220 5%	13L8R130J						
C212	1.0		10%	13D-111-35	NPO-SI 1.0	TCZ-1		CNO-510	5TCCB-V1S 10% *	
C213	51		N750 10%	.		TCN-51	C10Q51U		5TCU-Q51S 10% *	①
C214	2-6			31B-902-01		829-6		CT552		
C215	1000			3LJ-024	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C216	30			13M350U300N-02						
C217	1000			13M350EA102Z-01	EF-001	MFT-1000			503C-D1	
C218	1000			13LX102Z	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C219	1000			13M350EA102Z-01	EF-001	MFT-1000			503C-D1	

Note 1. Some versions may use 51mmf N470 10% in this application.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
NOTE : Part numbers listed above are "Standard Coil" Part Numbers.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PART No.
	OHMS	WATT	
R201	4700Ω		12TAE472M-01-02-03
R202	1000Ω		12TAE102M-01-02-03
R203	10K		12TAE103M-01-02-03
R204	5600Ω		12TAE562K-01-02-03

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R205	220K		12TAE224M-01-02-03	
R206	100K		12TAE104M-01-02-03	
R207	1000Ω		12WAE102M-01	
R208	10K		12TAE103M-01	

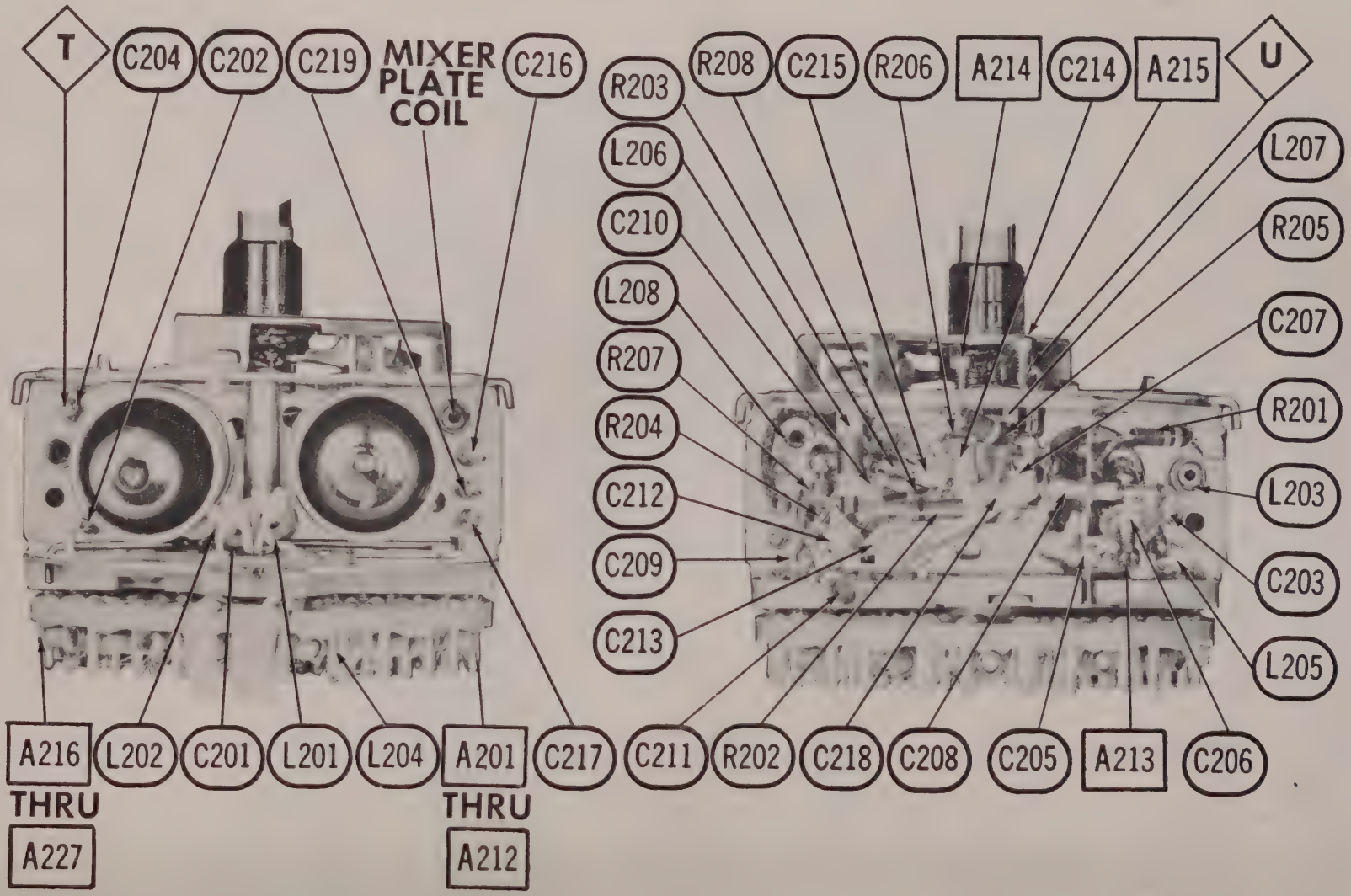
NOTE: Part numbers listed above are "Standard Coil" Part Numbers.

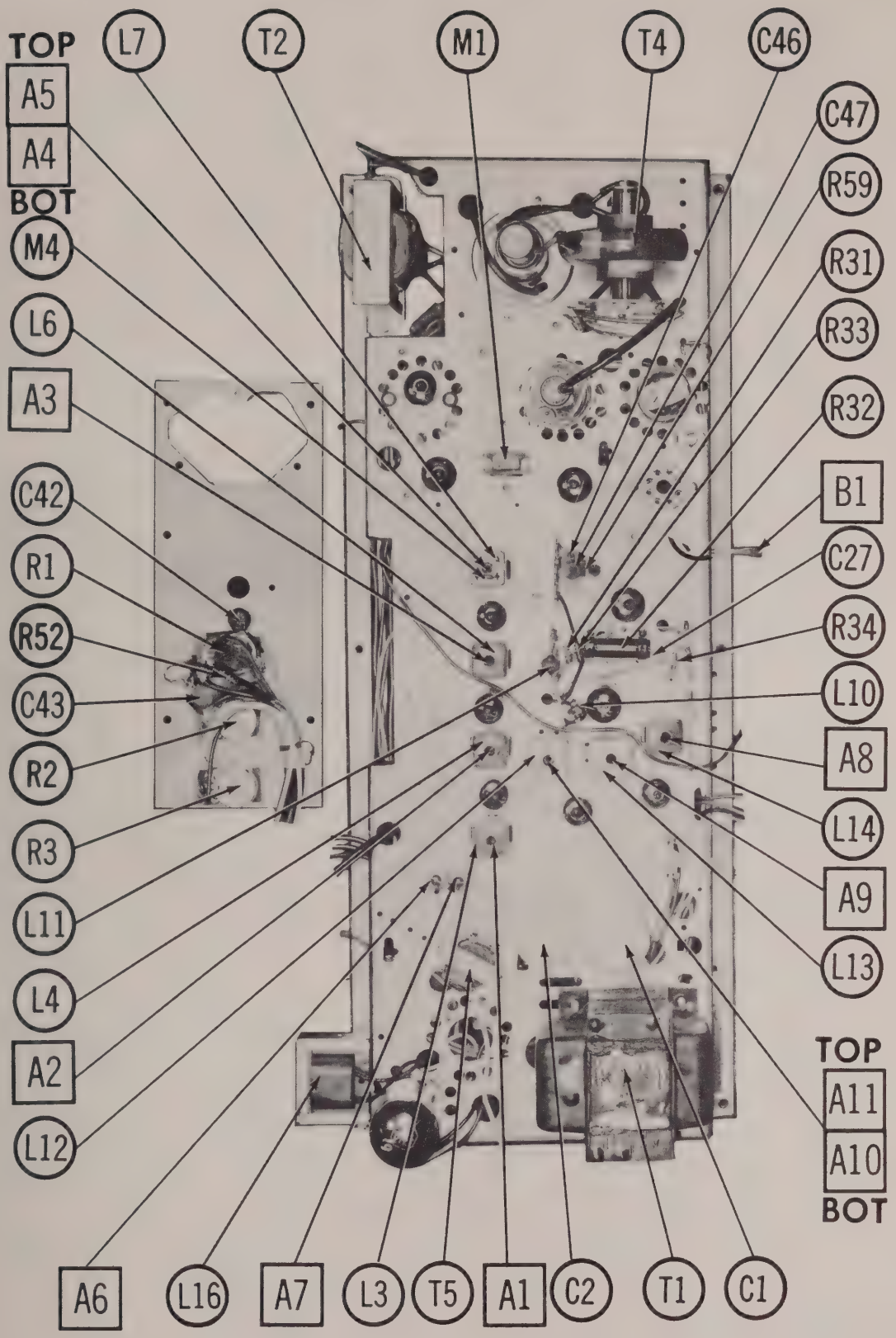
COILS (RF-IF)

ITEM No.	USE	PART No.	NOTES
L201	Ant. Trans.	31T3398-01	Includes L202, L203
L202	RF Choke	34A-748	
L203	IF Trap Coil	34A-762	
L204	Ant., RF, Mixer Grid & Osc. Coils	31T-3361-06	Includes Rotor Disc Assy.

ITEM No.	USE	PART No.	NOTES
L205	RF Choke	34A-1005	
L206	Fine Tuning Coil	34A-787-03	
L207	Fil. Choke	31K-137-027	
L208	Mixer Plate Coil	31UA-580-017	

NOTE: Part Numbers listed above are "Standard Coil" Part Numbers.


T
C204
C202
C219
MIXER PLATE COIL
C216
R203
L206
C210
L208
R207
R204
C212
C209
C213
R208
C215
R206
A214
C214
A215
U
L207
R205
C207
R201
L203
C203
L205
A216
THRU
A227
L202
C201
L201
L204
A201
THRU
A212
C217
C211
R202
C218
C208
C205
A213
C206



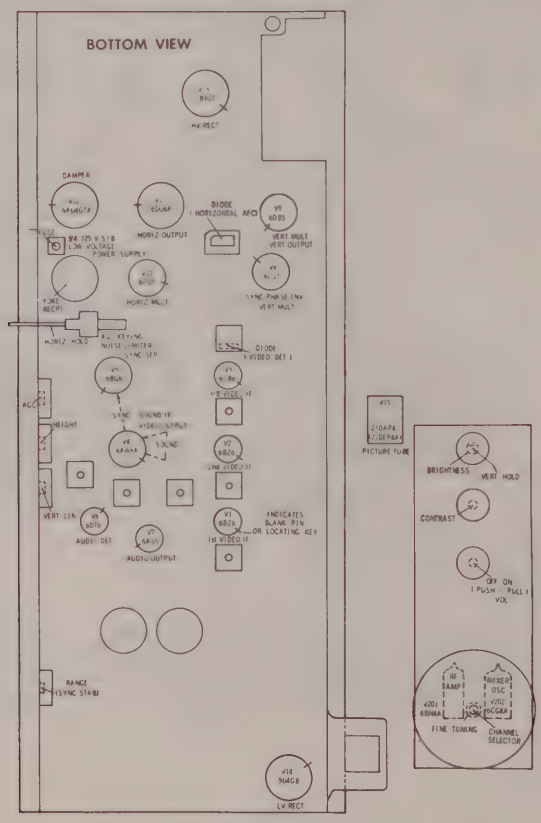
CHASSIS TOP VIEW

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	150K	47Ω	0Ω	.1Ω	▲ 470Ω	▲ 470Ω	0Ω		
V2	6BZ6	▲ 22K	▲ 68Ω	.1Ω	0Ω	†470Ω	†470Ω	160K		
V3	6CB6	.1Ω	150Ω	.1Ω	0Ω	■ 470Ω	■ 470Ω	0Ω		
V4	6AW8A	0Ω	100K	■ 45K	0Ω	.1Ω	● 50Ω	4800Ω	15K	†5600Ω
V5	6BU8	■ 0Ω	†8200Ω	1.5meg	0Ω	.1Ω	†25K	●†410K	†30K	■ 4.7meg
V6	6DT6	19Ω	680Ω	.1Ω	0Ω	†780K	■ 8200Ω	560K		
V7	6AS5	¶	550K	.1Ω	0Ω	550K	†220Ω	†510Ω		
V8	6CG7	● †1.5meg	220K	● 60K	0Ω	.1Ω	†12K	1.7meg	3300Ω	0Ω
V9	6DB5	†27K	● 500Ω	2.2meg	0Ω	.1Ω	2.2meg	●500Ω	NC	†840Ω
V10	6CG7	†10K	1meg	1200Ω	.1Ω	0Ω	†82K	68K	1200Ω	0Ω
V11	6DQ6A	NC	0Ω	NC	†12K	1meg	TP	.1Ω	0Ω	TOP CAP †10Ω
V12	6AU4GTA	NC	NC	¶700K	NC	†0Ω	NC	.1Ω	0Ω	
V13	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †440Ω
V14	5U4GB	NC	¶	NC	25Ω	NC	23Ω	NC	¶	
V15	21DAP4	0Ω	39K	†120K	0Ω	NC	39K	●■ 100K	.1Ω	
V201	6BN4A	0Ω	3.5meg	0Ω	.1Ω	■ 1300Ω	0Ω	3.5meg		
V202	6CG8A	10K	■ 5900Ω	0Ω	0Ω	.1Ω	■ 1300Ω	■ 10K	0Ω	320K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
■ MEASURED FROM 145V SOURCE.
† MEASURED FROM 265V SOURCE.
ǂ MEASURED FROM PIN 3 OF V12.
▲ MEASURED FROM PIN 7 OF V2.

NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

PHOTOFACT* Folder

AIRLINE MODELS WG-2673A, WG-2674A, WG-3503A, B

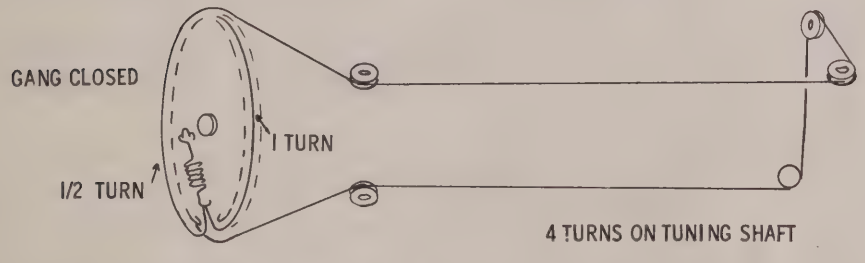
AIRLINE MODELS WG-2673A, WG-2674A, WG-3503A, B

AIRLINE MODELS WG-2673A, WG-2674A, WG-3503A, B

TRADE NAME	Airline Models WG-2673A, WG-2674A; WG-3503A, WG-3503B		
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois		
TYPE SET	AC Operated 10 Tube FM-AM Tuner & 7 Tube Amplifier With 4 Speed Automatic Record Changer		
POWER SUPPLY	105-125 Volts AC, 60 Cycles	RATING	180 Watts, 1.66 Amp. @ 117 Volts AC (Less Motor)
TUNING RANGE	BROADCAST 535 - 1620KC	FREQ.MOD.	88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #28A227 - SEE V-M 1200 - PHOTOFACT SET 290 FOLDER 11 OR RECORD CHANGER MANUAL CM-7

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

J180

DATE 8-59 SET 453 FOLDER 3

SET 453 FOLDER 3

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6CB6	
V2	FM Mixer - FM AFC	12AT7	
V3	FM Oscillator	6AB4	
V4	1st FM IF Amplifier	6AU6	
V5	AM RF Amplifier	6BA6	
V6	AM Converter	6BE6	
V7	2nd FM -1st AM IF Amp.	6BA6	
V8	FM Limiter - AM Det. - AVC	6AU6	

ITEM No.	USE	TYPE	NOTES
V9	Discriminator	6AL5	
V10	AF Amplifier	7025	
V11	AF Amp. - Phase Inv.	12AX7	
V12	Output	EL84/6BQ5	
V13	Output	EL84/6BQ5	
V14	Output	EL84/6BQ5	
V15	Output	EL84/6BQ5	
V16	Rectifier	5Y3GT	
V17	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	400	45X450			FP375.4		TVLS-4671.1*	
B	■40	400				TC78			
C	▲40	400							
D	40	200							
C2A	▲20	350	45X452	AFH3-43-50	C0344	FP376.9	TMT-39	TVL-3786	
B	■40	200							
C	▲40	200							
C3	100	25	45X449	PRS25V100	BR1005	TC2501	TD-100-25	TVA-1207	
C4	4	50NP	①	NP-PRS50V5	BBR8-150 †	TCN504		TVAS-1202.5*	

① Some versions may use 5mfd @ 10NP (Part #45X426).
† Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	10		NPO 10%	47X674	NPO-DI 10	DTZ-10	C10Q1C	CNO-410	5TCC-Q1S 10%*	
C6	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C7	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C8	47		N750 10%	47X670	N750-DI 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47S 10%*	
C9	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C10	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C11	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C13	1			47X588	NPO-SI 1	TCZ-1		CNO-510	5TCCB-V1	
C14	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C15	47		N750 10%	47X670	N750-DI 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47S 10%*	
C16	47		N750 10%	47X670	N750-DI 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47S 10%*	
C17	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C18	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C19	25		N2200							①
C20	2-9		N750	17A273						
C21	.1	100			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C22	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C23	.0022	200			P288N-0022	D6-222	CUB6D22	GEM-6222	6TM-D22	
C24	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C25	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C26	.022	200			P288N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C27	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C28	47		N750 10%	47X670	N750-DI 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47S 10%*	
C29	9		N3300							
C30	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C31	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C32	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C33	50000	100			BPD-05	DF-503	CUB2S5	BT-150	5HK-S5	
C34	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C35	2		N750±.25mmf	47X628						
C36	47		N750 10%	47X670	N750-DI 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47S 10%*	
C37	33		N750 10%	80X37	N750-SI 33	DTN-33	C10Q33U	CN7-433	5TCU-Q33S 10%*	
C38	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C39	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C40	100		N150							

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C41	680		10%		DI-680	MD-681	1R5T68	JL-368	MS-368	
C42	180		10%	80X40	DI-180	MD-181	L10T18		MS-318	
C43	.047	200			P288N-047	DF-503	CUB2S47	GEM-4147	4TM-S47	
C44	.0025	200			P288N-0025	D6-252	CUB6D25	GEM-6225	6TM-D25	
C45	.0047	400			P488N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C46	.1	200			P488N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C47	330		10%	80X41	DI-330	MD-331	L10T33	JL-330	MS-333	
C48	.0025	200			P288N-0025	D6-252	CUB6D25	GEM-6225	6TM-D25	
C49	1500			47X545	SI 1500	D6-152	BYA10D15	UC-5215	5HK-D15	
C50	.0025	200			P288N-0025	D6-252	CUB6D25	GEM-6225	6TM-D25	
C51	1500			47X545	SI 1500	D6-152	BYA10D15	UC-5215	5HK-D15	
C52	33		N750 10%	80X37	N750-DI 33	DTN-33	C10Q33U	CN7-433	5TCU-Q33S 10%*	
C53	10		NPO 10%	47X674	NPO-DI 10	DTZ-10	C10Q1C	CNO-410	5TCC-Q1S 10%*	
C54	1500			47X545	SI 1500	D6-152	BYA10D15	UC-5215	5HK-D15	
C55	.047	200			P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C56	1500			47X545	SI 1500	D6-152	BYA10D15	UC-5215	5HK-D15	
C57	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C58	43		N750 10%			TCN-43			5TCU-Q43S 10%*	
C59	43		N750 10%			TCN-43			5TCU-Q43S 10%*	
C60	82		10%		1469-000082	D6-820	22R5Q82	CNO-482	MS-482	
C61	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C62	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C63	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C64	680		10%		DI-680	MD-681	1R5T68	JL-368	5GA-T68S 10%*	
C65	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	36X406 ①	BT-7417	A47F3-1meg	Q18-137X	RU16T15 *	Level, Tap @ 100K
B	Shaft			Not Req.	FS-3	Not Req.	SL3500	
R2	2meg	½	36X405	BT-175		Q13-139XX	UDT-296	Contour, Taps @ 650K,
R3A	500K	½	40X451	B-60	A47-500K-Z	Q13-133	U48	Treble 1.5meg
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1meg	½	40X450	B-70	A47-1meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	400Ω	1(WW)	40X452	WN-401	A43-400	W11-202	R500L	Hum Balance
B	Shaft			Not Req.	FKS-1/4	WM Kit	Not Req.	

① Some versions may use Part #36X404. * Use SL-38 bushing.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	AIRLINE PART No.	NOTES
R6	2.2meg			
R7	10K			
R8	1meg			
R9	47K			
R10	22K			
R11	220Ω			
R12	680Ω			
R13	1000Ω			
R14	33Ω			
R15	470K			
R16	470K			
R17	15K	1		
R18	220Ω			
R19	1meg			
R20	4700Ω			
R21	3.3meg			
R22	68K			
R23	100Ω			
R24	12K			
R25	33Ω			

ITEM No.	RATING OHMS	RATING WATT	AIRLINE PART No.	NOTES
R26	39K			
R27	6800Ω			
R28	4700Ω			
R29	330Ω			
R30	68Ω			
R31	100K			
R32	2.2meg			
R33	100K			
R34	15K		B85153	
R35	15K		B85153	
R36	100K 5%			
R37	100K 5%			
R38	100K 5%			
R39	470K			
R40	1meg 5%			
R41	220K			
R42	100K			
R43	560Ω			
R44	180K			
R45	470K			

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	AIRLINE PART No.	NOTES
R46	33K			
R47	220K			
R48	470K			
R49	220K			
R50	100K			
R51	2.2meg			
R52	47K			
R53	3300Ω			
R54	1000Ω			
R55	2.7meg			
R56	2.7meg			
R57	1meg			
R58	330K			
R59	560Ω			
R60	180K			
R61	1meg			
R62	82K			
R63	100K			

ITEM No.	RATING OHMS	RATING WATT	AIRLINE PART No.	NOTES
R64	2200Ω			
R65	82K			
R66	100K			
R67	100Ω			
R68	100Ω			
R69	100Ω			
R70	56Ω	1	C84560	
R71	65Ω	5	43X309	
R72	100Ω			
R73	56Ω	1	C84560	
R74	6800Ω			
R75	68Ω			
R76	1000Ω	1		
R77	330Ω	1		
R78	4700Ω			
R79	10K	2		
R80	680Ω	4		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA AIRLINE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	9A2448	19-1000	19-1000	BC-561	4602		
L2	RF Choke	35A8						3.3uh ①
L3	FM RF Plate Coil	9A2445						
L4	FM RF Grid Coil	9A2446						
L5	Fil. Choke	35A6	19-1001	19-1001	BC-562	4604		1.5uh ①
L6	FM Osc. Coil	9A2447						
L7	RF Choke	35A8						3.3uh ①
L8	Loopstick	9A2441						
L9	AM RF Coil	9A2439						Tapped @ 6.4Ω
L10	AM Osc. Coil	9A2438						Tapped @ .3Ω
L11	Fil. Choke	35A6	19-1001	19-1001	BC-562	4604		1.5uh ①
L12	1st FM IF Trans.	9A2440	16-3487	16-3487	FM-254	1463		
L13	1st AM IF Trans.	9A2443	16-6758	16-6758	BC-352	12-C1	RF-1	
L14	2nd FM IF Trans.	9A2440	16-3487	16-3487	FM-254	1463		
L15	2nd FM IF Trans.	9A2443	16-6758	16-6758	BC-353	12-C2	RF-2	
L16	3rd FM IF Trans.	9A2440	16-3487	16-3487	FM-254	1463		
L17	Fil. Choke	35A6	19-1001	19-1001	BC-562	4604		1.5uh ①
L18	Discriminator	9A2442	17-3494	17-3494	FM-253	1464		

① IRC Part #CLA.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.66A	620VCT @ .190A Tap @ 280VCT @ .038A	5V @ 3A	53X371 ①						
	SEC. 3	SEC. 4	SEC. 5							
	5V @ 2A	12V @ 1.8A	6.3V @ 3.1A							

① Part #53X376 used in Model WG3503A, B.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	3000Ω CT	3-4Ω	51X194 ①	22S72 ②				22S72 ②	S-33A ②	

① Part #51X202 used in Model WG-3503A, B. ② Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	REPLACEMENT DATA AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	16Ω Tap @ 7Ω	51X196							

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA AIRLINE PART No.	QUAM PART No.	NOTES
SP1	12"	PM	8-10Ω	12A569	12A6A	① Horn Type Tweeter
SP2	12"	PM	8-10Ω	12A569	12A6A	
SP3		PM	16Ω	12A568 ①		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA AIRLINE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1	AST-89TX (60-58)	89-TX				Includes needles (Monaural)
	28A228-2 (60-61)	13TX				Includes needles (Stereo)

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA AIRLINE PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2				Monaural
			† W-101STS or † W-102S	Stereo

*Metal †Jewel ♦Diamond

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Tuning Cap.	14A235	6 Gang (AM Sections: Ant. 13-332mmf, RF 12-217mmf, Osc. 10-143mmf)
M4	Switch	2A493	Function
M5	Switch	2A492	Speaker Off-On

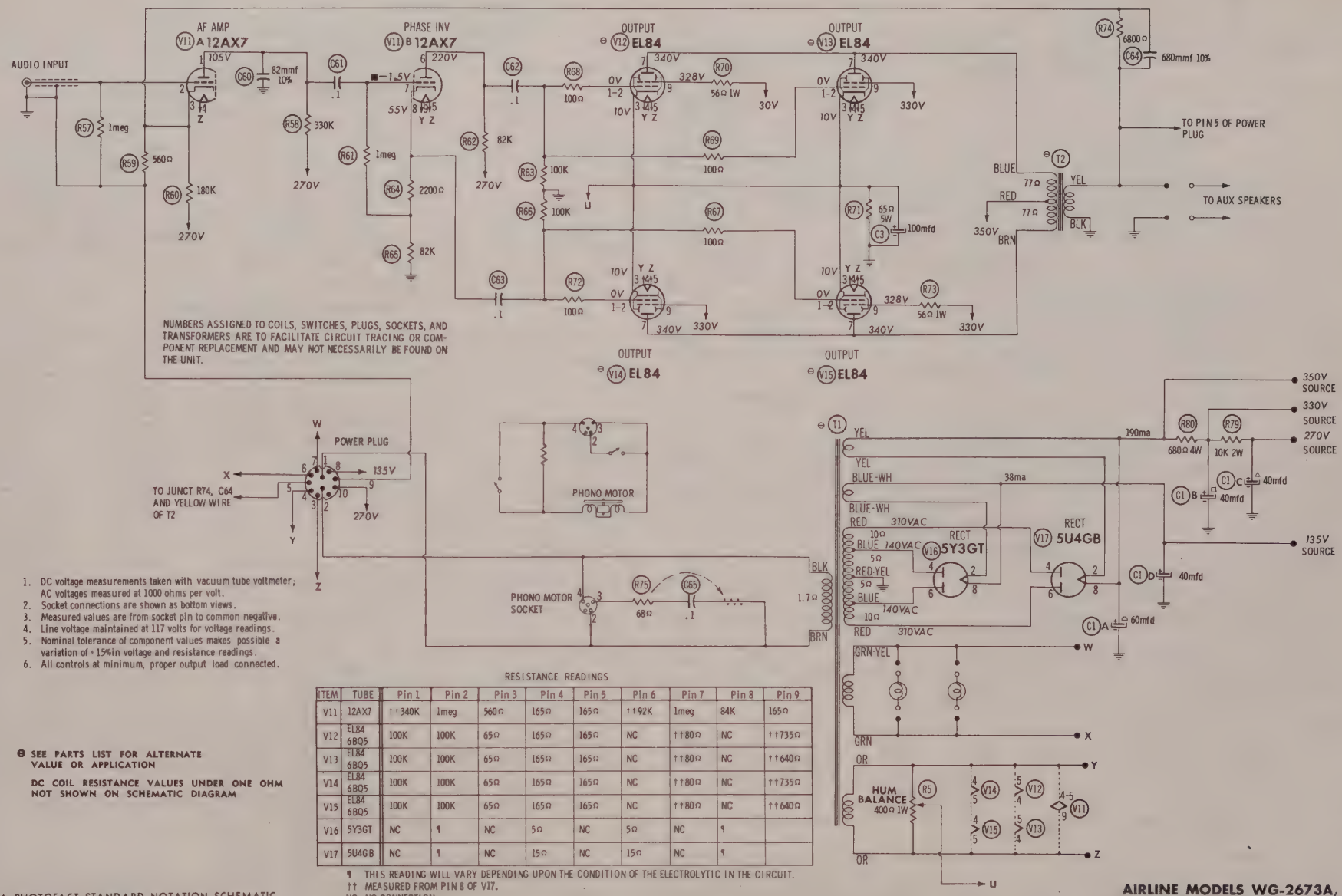
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	10A963	Tuning, Off-On Speaker Switch
Knob	10A960-1	Bass, Treble, Contour, Level, & Function
Dial Glass	58X808	
Dial Plate	25X2167-1	
Dial Pointer	15X286-1	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V11	12AX7	††340K	1meg	560Ω	165Ω	165Ω	††92K	1meg	84K	165Ω
V12	EL84 6BQ5	100K	100K	65Ω	165Ω	165Ω	NC	††80Ω	NC	††735Ω
V13	EL84 6BQ5	100K	100K	65Ω	165Ω	165Ω	NC	††80Ω	NC	††640Ω
V14	EL84 6BQ5	100K	100K	65Ω	165Ω	165Ω	NC	††80Ω	NC	††735Ω
V15	EL84 6BQ5	100K	100K	65Ω	165Ω	165Ω	NC	††80Ω	NC	††640Ω
V16	5Y3GT	NC	¶	NC	5Ω	NC	5Ω	NC	¶	
V17	5U4GB	NC	¶	NC	15Ω	NC	15Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
†† MEASURED FROM PIN 8 OF V17.
NC NO CONNECTION.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

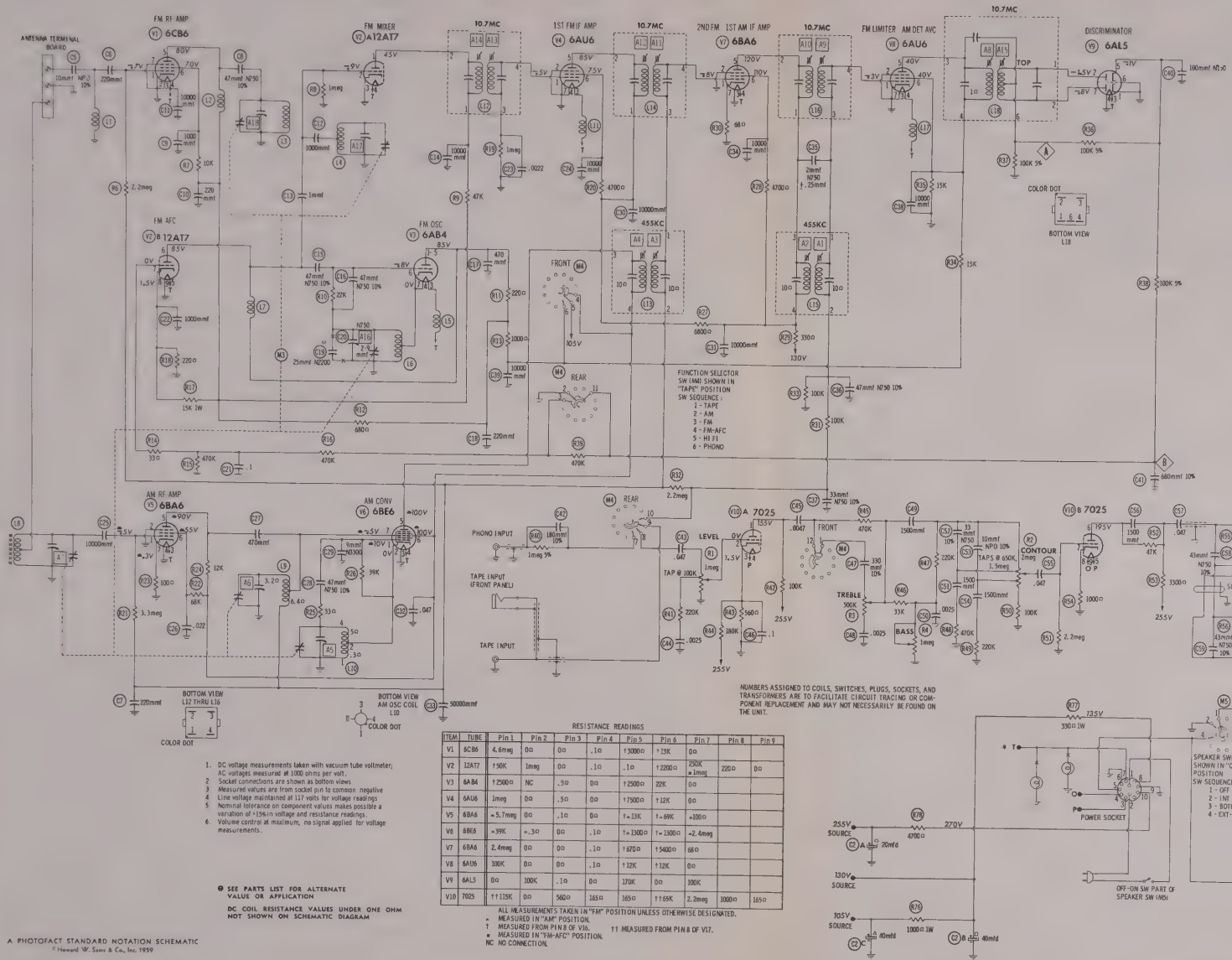
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1959

AIRLINE MODELS WG-2673A, WG-2674A, WG-3503A, B

AMP. SCHEMATIC FOR MODELS WG-2673A, WG-2674A



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum; no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

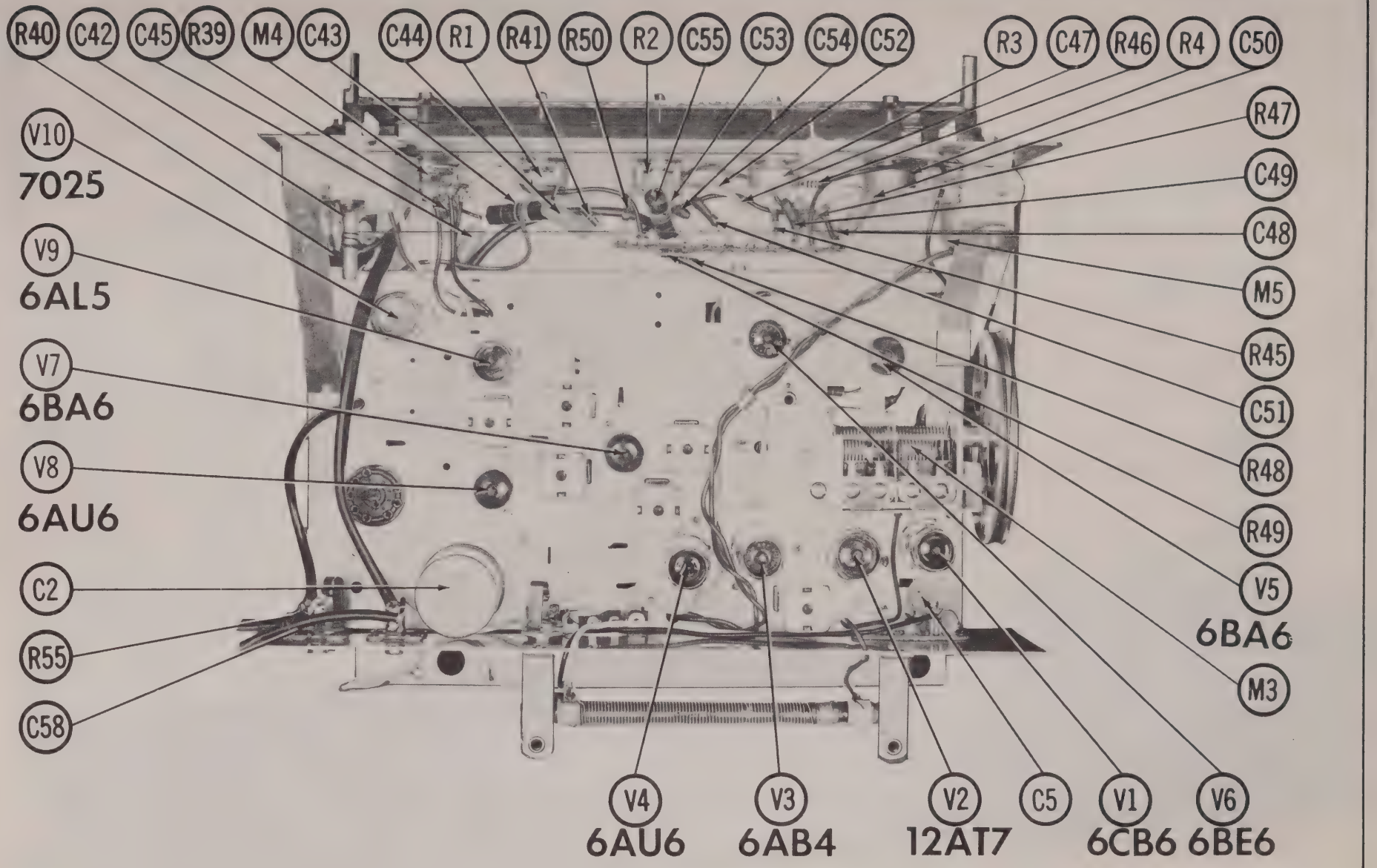
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	4.6meg	0Ω	0Ω	.1Ω	↑3000Ω	↑13K	0Ω		
V2	12AT7	↑50K	1meg	0Ω	.1Ω	.1Ω	↑2200Ω	250K ● 1meg	220Ω	0Ω
V3	6AB4	↑2500Ω	NC	.5Ω	0Ω	↑2500Ω	22K	0Ω		
V4	6AU6	1meg	0Ω	.5Ω	0Ω	↑7500Ω	↑12K	0Ω		
V5	6BA6	●5.7meg	0Ω	.1Ω	0Ω	↑●13K	↑●69K	●100Ω		
V6	6BE6	●39K	●.3Ω	0Ω	.1Ω	↑●1300Ω	↑●1300Ω	●2.4meg		
V7	6BA6	2.4meg	0Ω	0Ω	.1Ω	↑670Ω	↑5400Ω	68Ω		
V8	6AU6	100K	0Ω	0Ω	.1Ω	↑12K	↑12K	0Ω		
V9	6AL5	0Ω	100K	.1Ω	0Ω	170K	0Ω	100K		
V10	7025	↑↑115K	0Ω	560Ω	165Ω	165Ω	↑↑65K	2.2meg	1000Ω	165Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
● MEASURED IN "AM" POSITION.
↑ MEASURED FROM PIN 8 OF V1A. ↑↑ MEASURED FROM PIN 8 OF V1B.
■ MEASURED IN "FM-AFC" POSITION.
NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1959

AIRLINE MODELS WG-2673A, WG-2674A, WG-3503A, B

TUNER SCHEMATIC



TUNER CHASSIS TOP VIEW - CAPACITOR, RESISTOR, MISC. & TUBE IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Output of signal generator should be no higher than necessary to obtain an output reading.
Set Level, Bass and Treble at center of their ranges. Set Contour Control fully clockwise.
Suggested Alignment Tools: A1 thru A4, A8 thru A15 ..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5 thru A7, A16 thru A18 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 1 (grid) of AM RF Amp. Low side to chassis.	455KC (400~ Mod.)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	"	A5	"
3.	"	"	1400KC	"	Tune to 1400KC signal.	"	A6	Adjust for maximum output while rocking tuning gang.
4.		Loop	"	"	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.005mfd	High side to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC probe thru 100K to point (A). Common to chassis.	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe thru 100K to point (B). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.005mfd	High side to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. Amp. thru 100K to point (A). Low side to chassis.	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	"	"	"	"	Vert. Amp. thru 100K to point (B). Low side to chassis.	A15	Adjust so that 10.7MC marker occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across FM antenna terminals with 120Ω in each lead.	108MC (400~ FM Mod.)	FM	Tuning gang fully open	Across voice coil	A16	Adjust for maximum output.
8.	"	"	105MC	"	105MC	"	A17, A18	Adjust for maximum output while rocking tuning gang.

FIG. 1

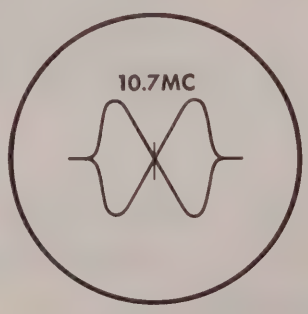
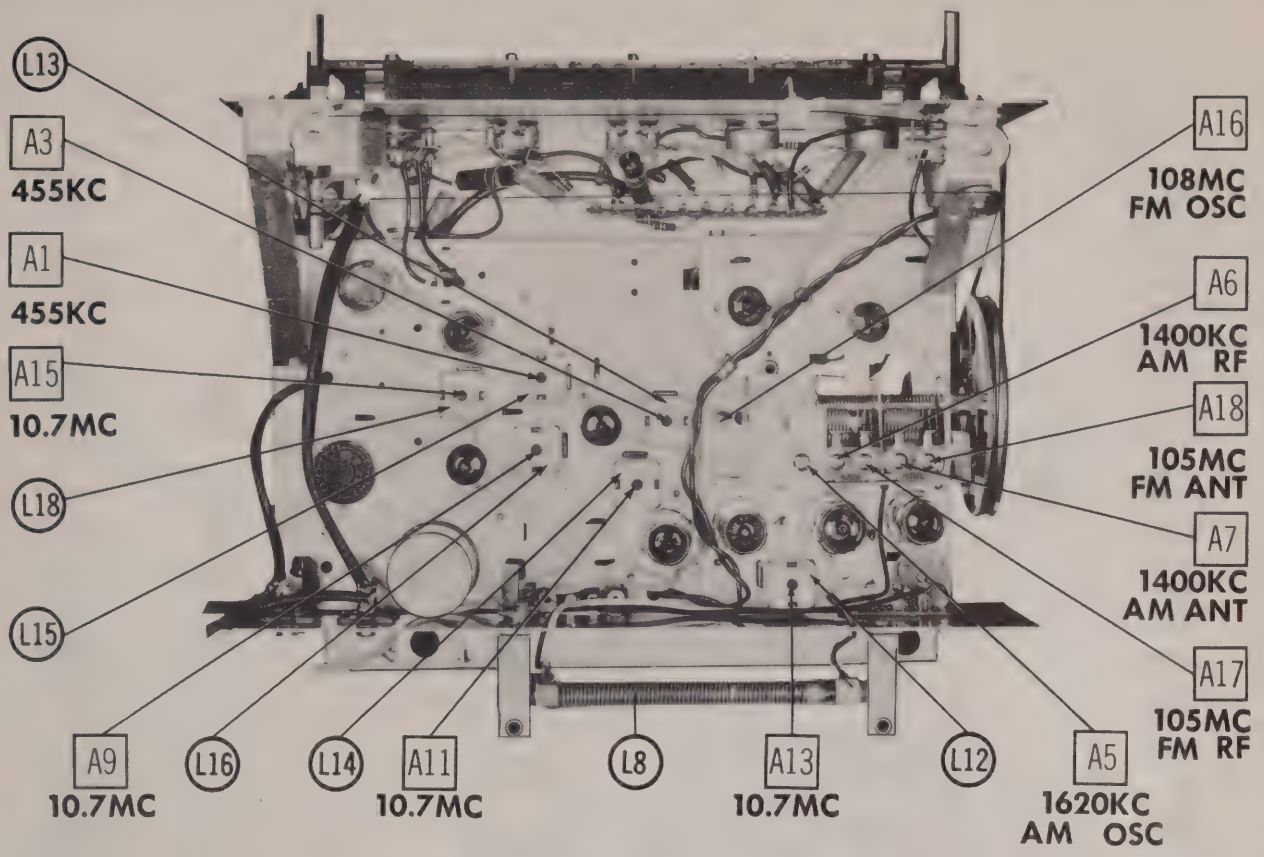
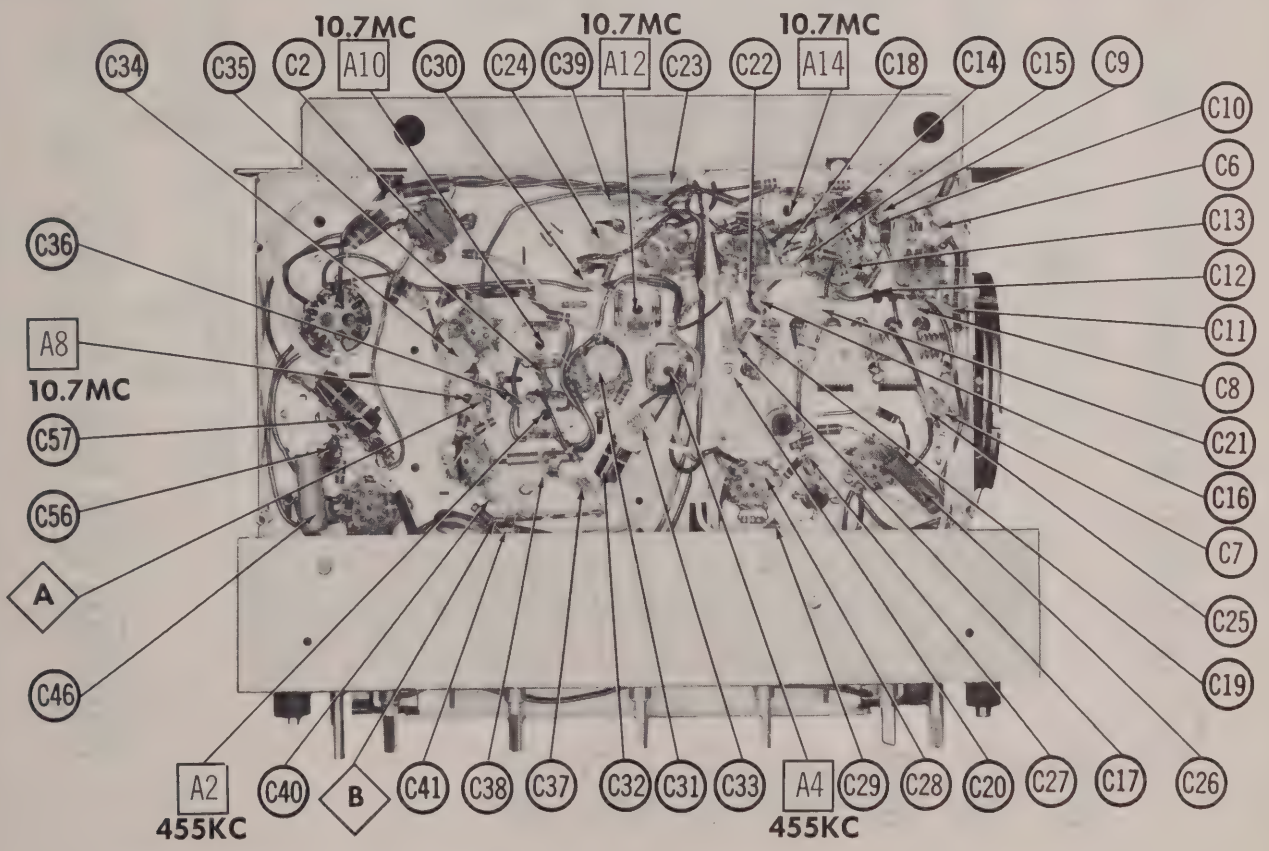


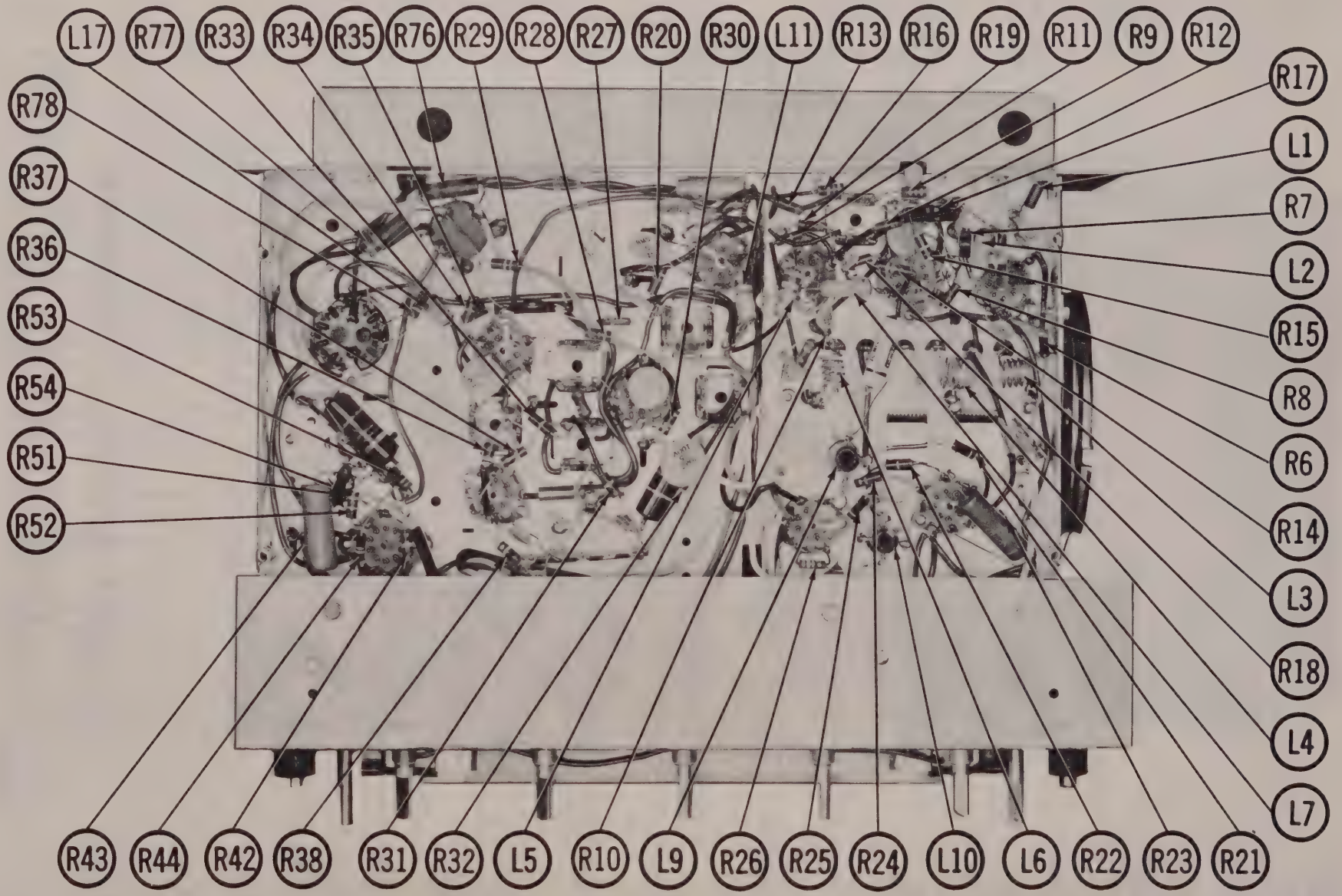
FIG. 2



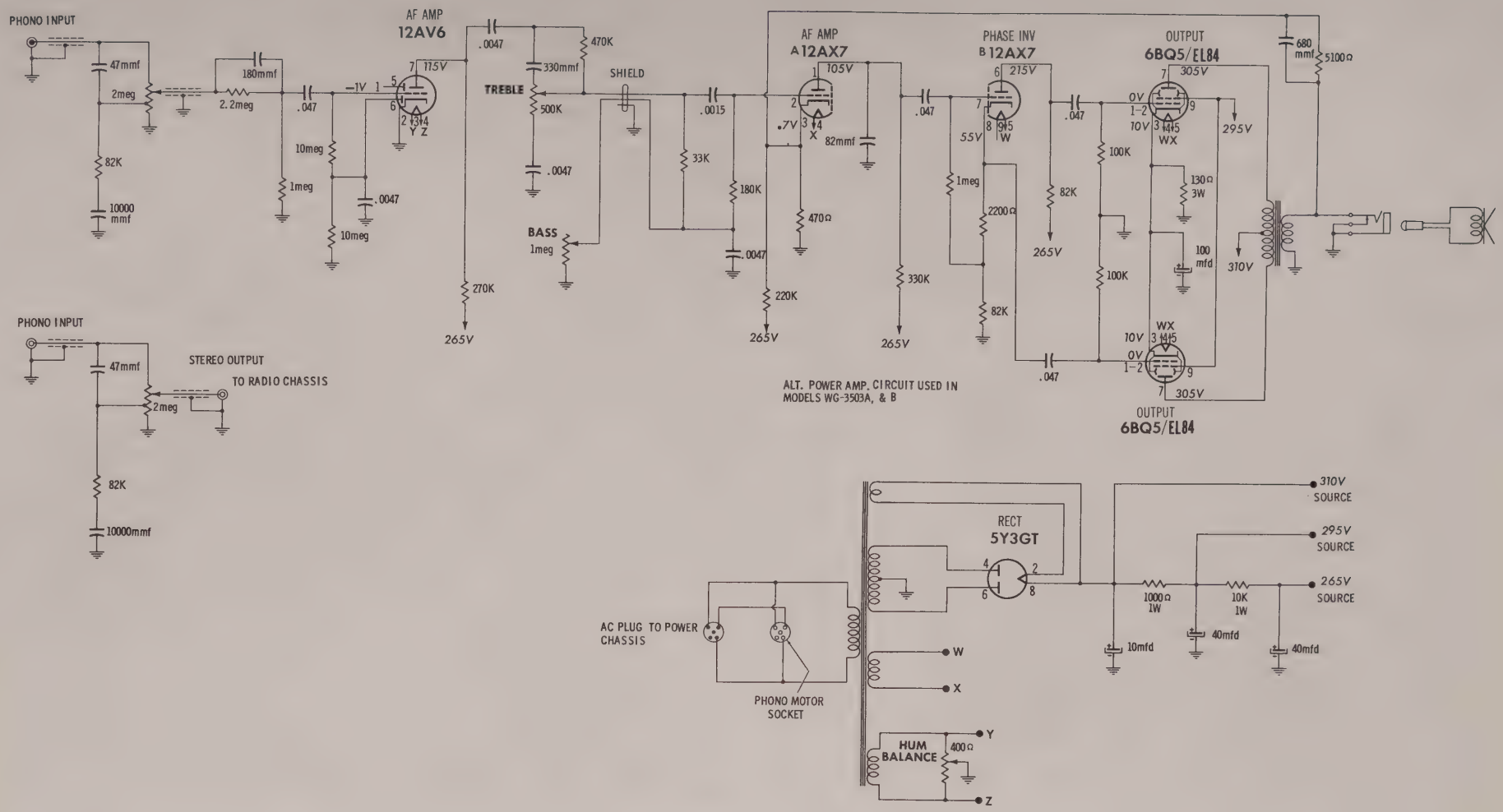
TUNER CHASSIS TOP VIEW - INDUCTOR & ALIGNMENT IDENT.



TUNER CHASSIS BOTTOM VIEW - CAPACITOR & ALIGNMENT IDENT.



TUNER CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



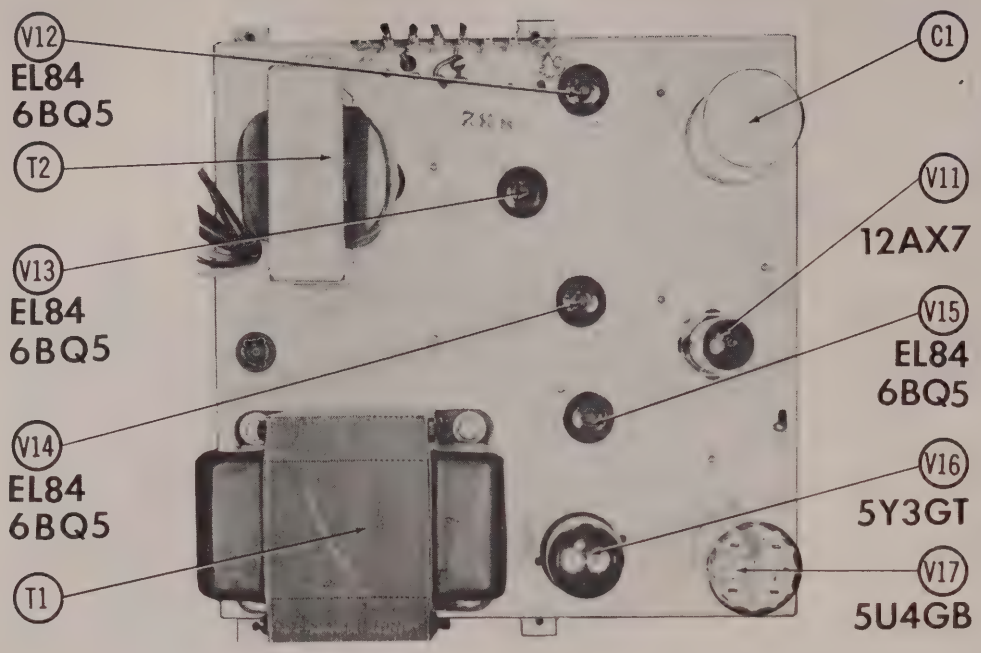
A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1959

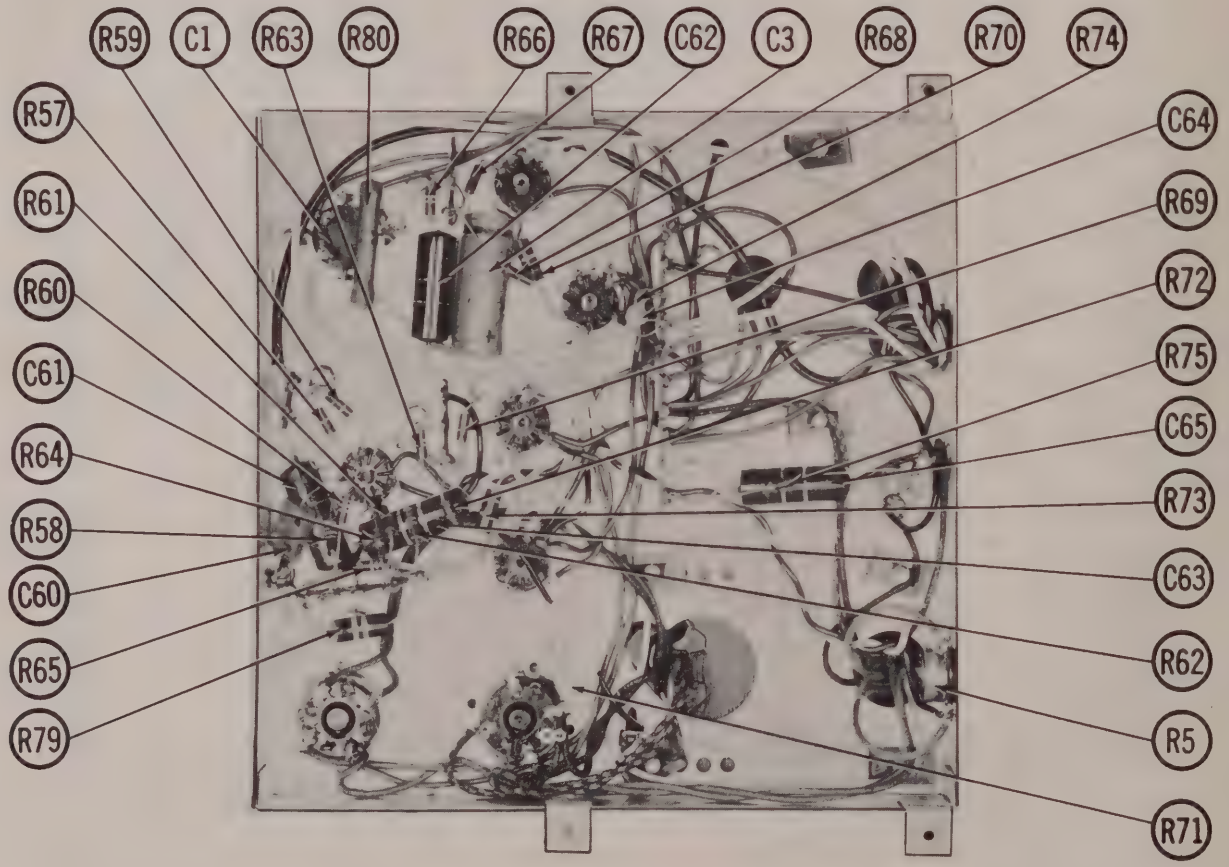
AIRLINE MODELS WG-2673A, WG-2674A, WG-3503A, B

AMPLIFIER SCHEMATIC FOR MODELS WG-3503A, B

AIRLINE
MODEL WG-2673A



AMPLIFIER CHASSIS - TOP VIEW



AMPLIFIER CHASSIS - BOTTOM VIEW

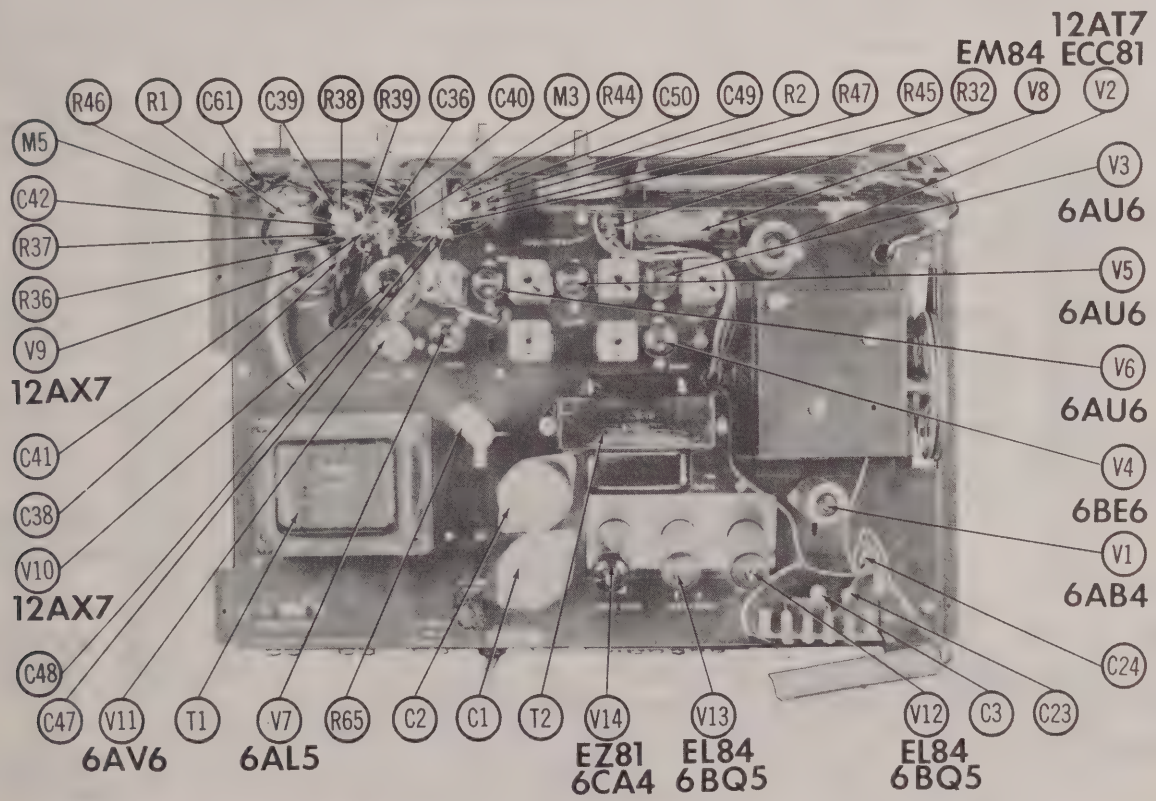
PHOTOFACT* Folder

EIA MEMBER

BELL SOUND MODEL 2521

BELL SOUND
MODEL 2521

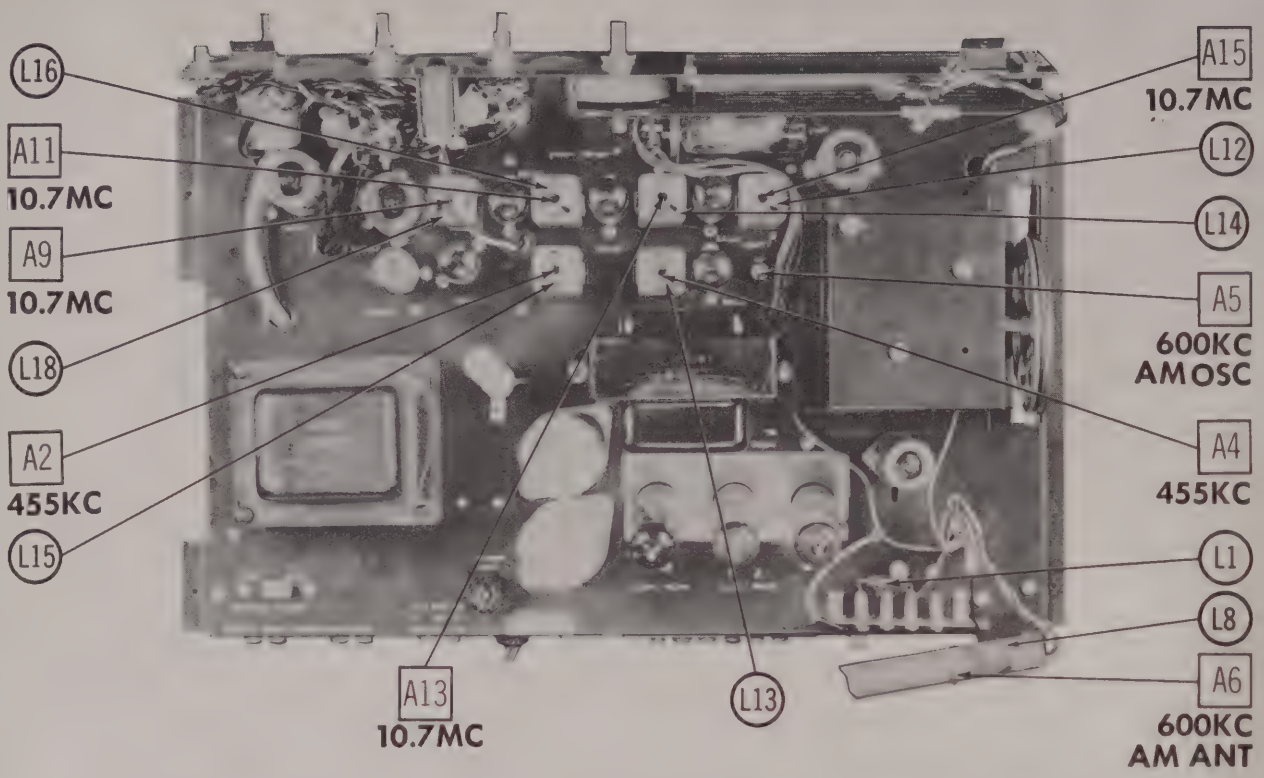
TRADE NAME	Bell Sound Model 2521		
MANUFACTURER	Bell Sound Systems, Inc., 555 Marion Road,. Columbus 7, Ohio		
TYPE SET	AC Operated 14 Tube FM-AM Receiver		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	100 Watts, 1 Amp. @117 Volts AC
TUNING RANGE—BROADCAST 540-1650KC		FREQ. MOD.	88 —108MC



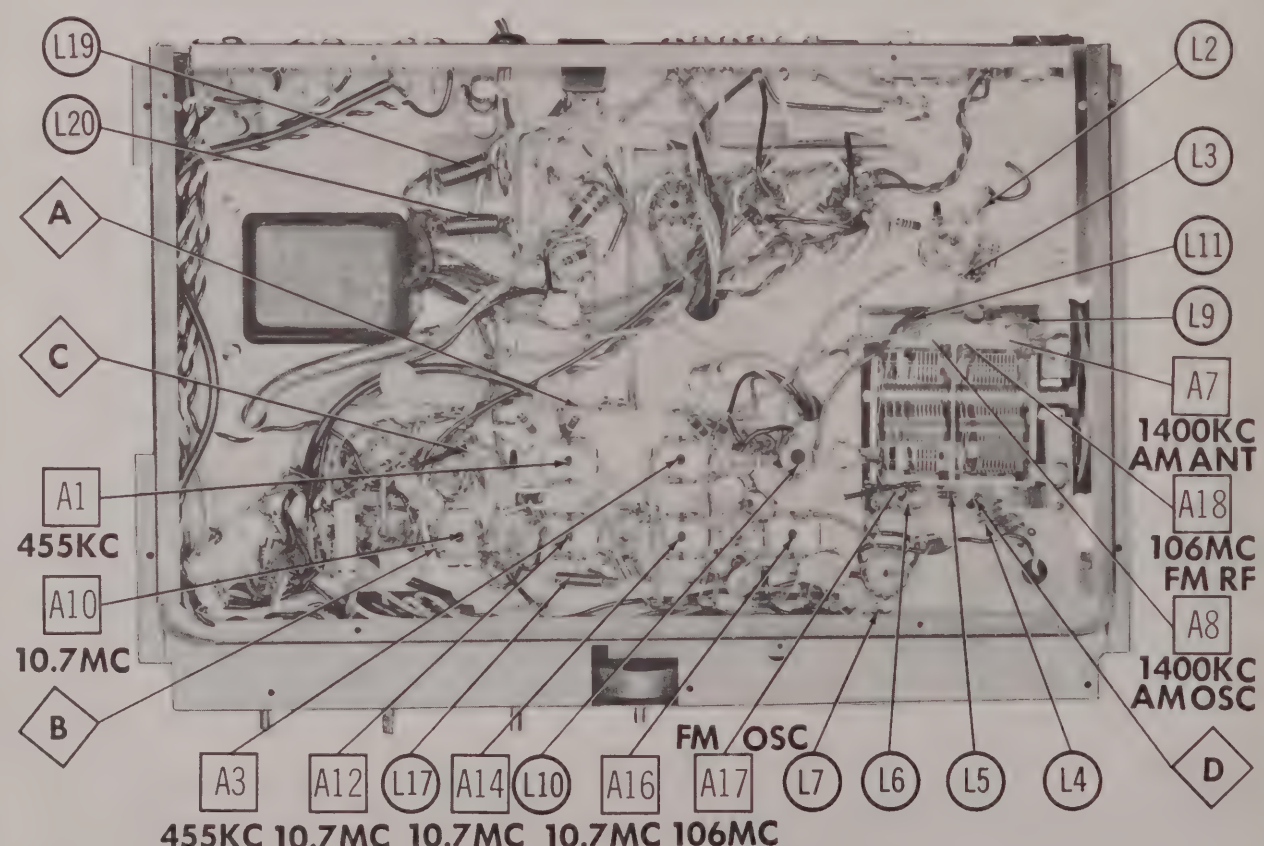
BELL SOUND
MODEL 2521

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

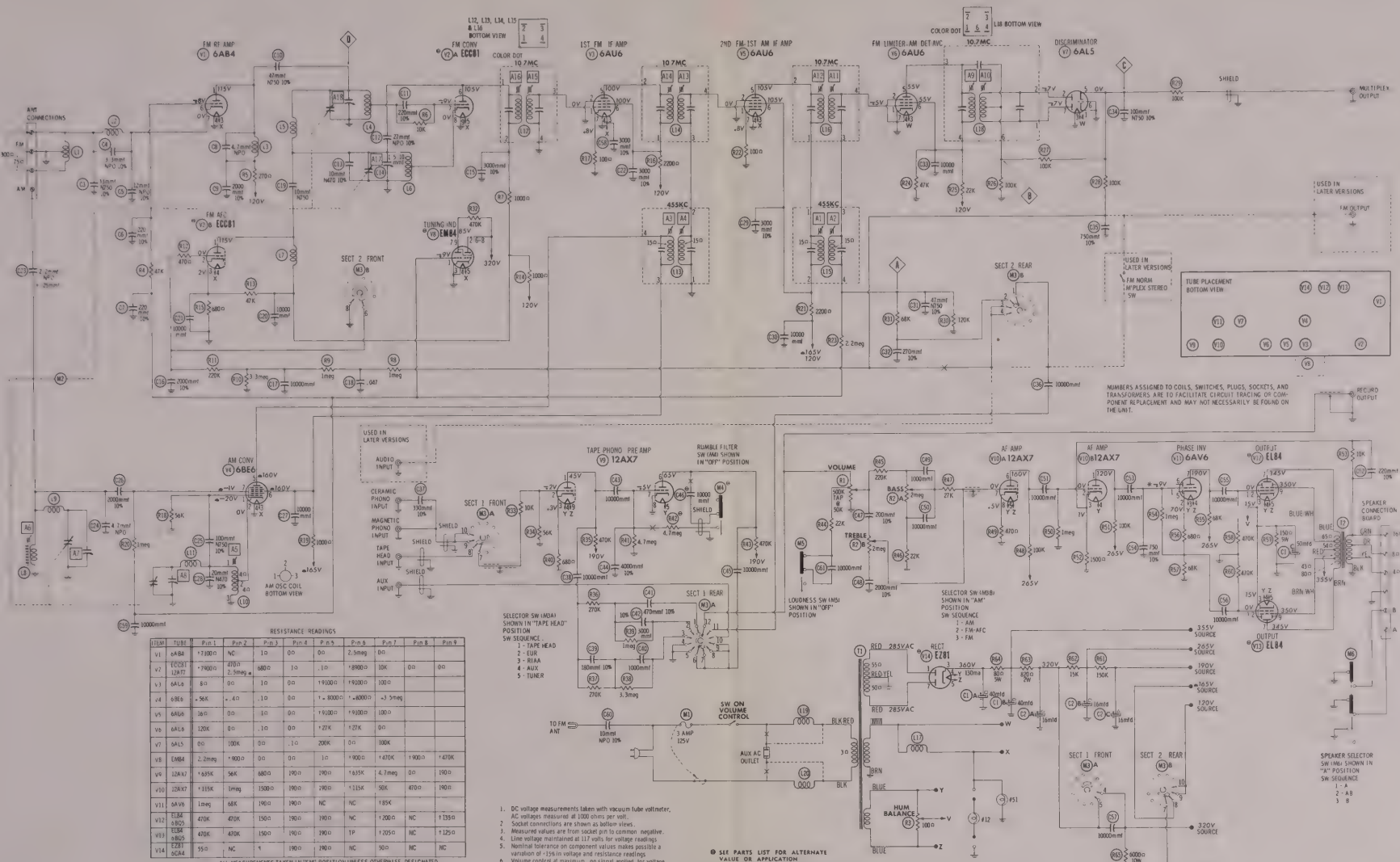
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



CHASSIS TOP VIEW — ALIGNMENT & INDUCTOR IDENT.



CHASSIS BOTTOM VIEW — ALIGNMENT & INDUCTOR IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AB4	*7300Ω	NC	1Ω	0Ω	0Ω	2.5meg	0Ω		
V2	ECC81 12AT7	*790Ω	470Ω 2.5meg ●	680Ω	1Ω	1Ω	*8900Ω	10K	0Ω	0Ω
V3	6AU6	8Ω	0Ω	1Ω	0Ω	*9100Ω	*9200Ω	100Ω		
V4	6BE6	56K	4Ω	.1Ω	0Ω	* 8000Ω	*8000Ω	3.5meg		
V5	6AU6	16Ω	0Ω	1Ω	0Ω	*9100Ω	*9200Ω	100Ω		
V6	6AL6	120K	0Ω	.1Ω	0Ω	*27K	*27K	0Ω		
V7	6AL5	0Ω	100K	0Ω	.1Ω	200K	0Ω	100K		
V8	EM84	2.2meg	*900Ω	0Ω	0Ω	1Ω	*900Ω	*470K	*900Ω	*470K
V9	12AX7	*635K	56K	680Ω	190Ω	190Ω	*635K	4.7meg	0Ω	190Ω
V10	12AX7	*115K	1meg	1500Ω	190Ω	190Ω	*115K	50K	470Ω	190Ω
V11	6AV6	1meg	68K	190Ω	190Ω	NC	NC	*85K		
V12	EL84 6BQ5	470K	470K	150Ω	190Ω	190Ω	NC	*200Ω	NC	*135Ω
V13	EL84 6BQ5	470K	470K	150Ω	190Ω	190Ω	TP	*205Ω	NC	*125Ω
V14	EZ81 5CA4	55Ω	NC	¶	190Ω	190Ω	NC	90Ω	NC	NC

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 3 OF V14.
● MEASURED FROM PIN 2 OF V11.
NC NO CONNECTION
TP TEST POINT
■ MEASURED IN "FM-AFC" POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1959

BELL SOUND MODEL 2521

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
- A1 thru A4, A9 thru A16.....GENERAL CEMENT #5097, 8727 WALSCO #2515
- A5, A6.....GENERAL CEMENT #8606, 8606L, 8282, 9295 WALSCO #2526, 2543, 2544, 2545
- A7, A8, A17, A18.....GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of AM converter. Low side to chassis.	455KC (Unmod.)	AM	Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	200mmf	High side to AM antenna terminal. Low side to chassis.	600KC	"	600KC	"	A5, A6	"
3.	"	"	1400KC	"	1400KC	"	A7, A8	Adjust for maximum deflection. Repeat Steps 2 & 3 until no further improvement is noted.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR & VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
4.	.01mfd	High side to point Ⓓ. Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC probe to point Ⓑ. Common to chassis.	A9, A11, A12, A13, A14, A15, A16	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR & OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01mfd	High side to point Ⓓ. Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. amp. to point Ⓑ. Low side to chassis.	A9, A11 A12, A13, A14, A15 A16	Adjust for maximum gain and symmetry of response with markers as shown in Fig. 1.
5.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A10	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across FM antenna terminals with 120Ω in each lead	106MC (Unmod.)	FM	106MC	DC probe to point Ⓑ. Common to chassis.	A17, A18	Adjust for maximum deflection.
10.	"	"	90MC	"	90MC	"	L6 L4	Adjust for maximum deflection by compressing or expanding coil turns. Repeat Steps 9 & 10.

FIG. 1

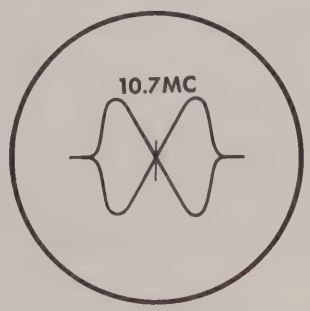
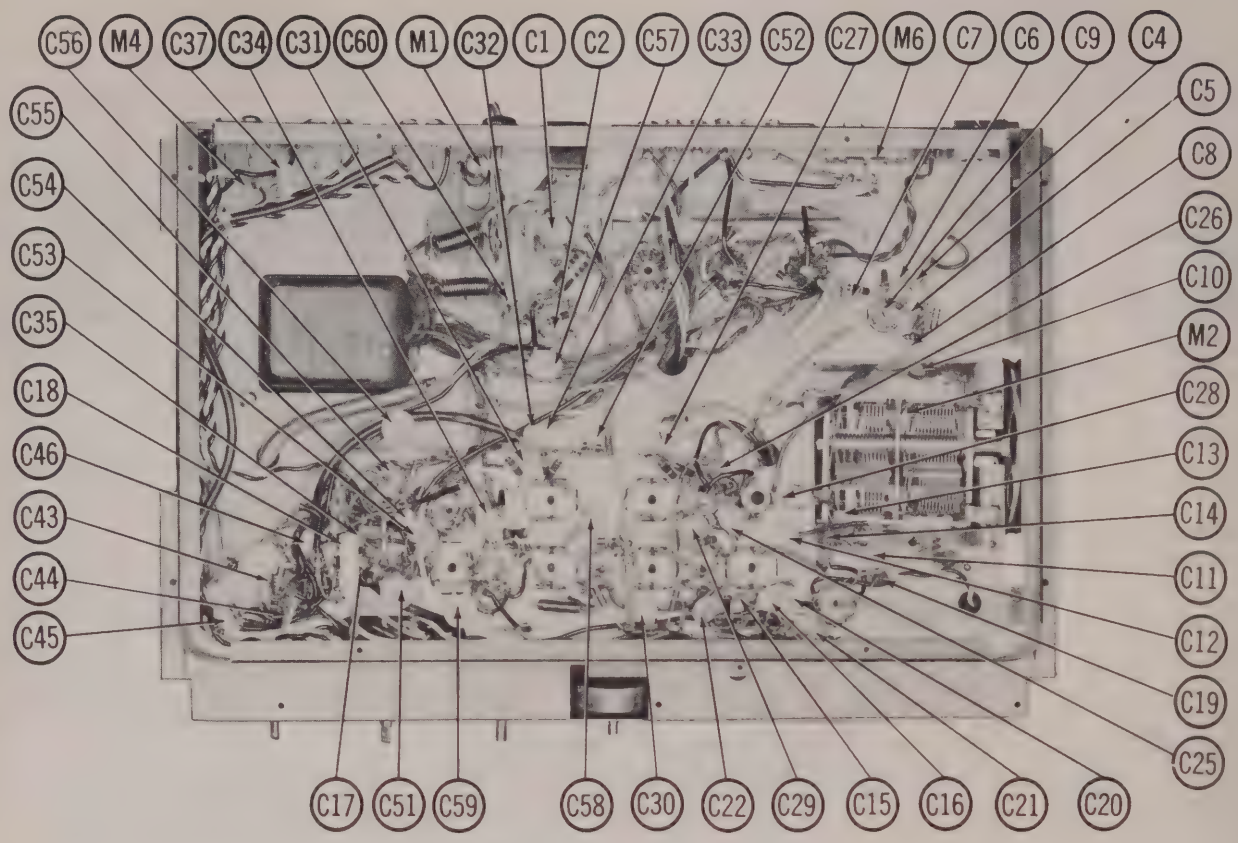
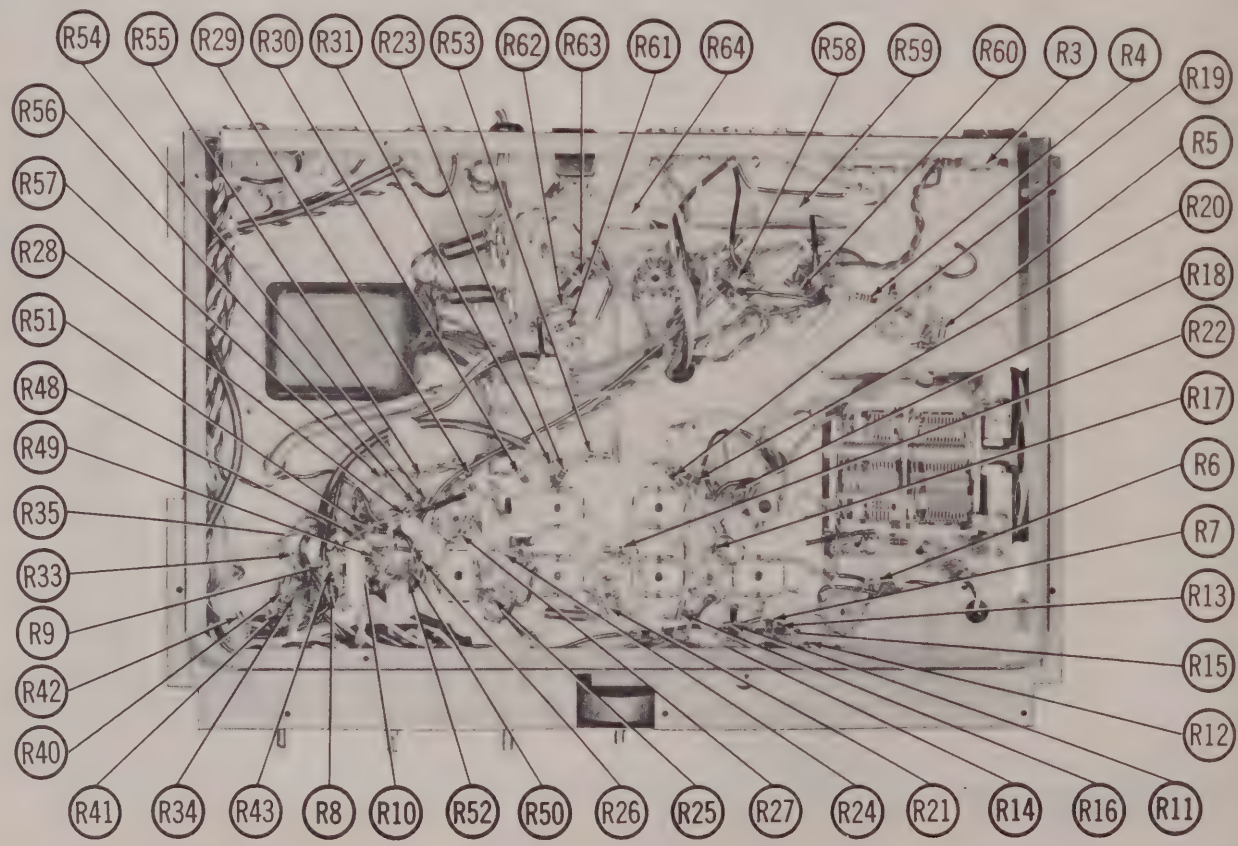


FIG. 2



CHASSIS BOTTOM VIEW – CAPACITOR & MISC. IDENT.



CHASSIS BOTTOM VIEW – RESISTOR IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6AB4	
V2	FM Conv. -FM AFC	ECC81/12AT7	
V3	1st FM IF Amplifier	6AU6	
V4	AM Converter	6BE6	
V5	2nd FM-1st AM IF Amp.	6AU6	
V6	FM Limiter-AM Det.-AVC	6AU6	
V7	Discriminator	6AL5	
V8	Tuning Indicator	EM84	6FG6 *
V9	Tape-Phono Preamp.	12AX7	
V10	AF Amplifier	12AX7	
V11	Phase Inverter	6AV6	
V12	Output	EL84/6BQ5	
V13	Output	EL84/6BQ5	
V14	Rectifier	EZ81/6CA4	

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BELL SOUND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■40	400	23B35		C1060	FP280		TVLS-3679.5*	
B	▲40	400			BR4045	TC78			
C	▲50	25							
C2A	▲16	450	23B2	AFH4-19-10	C0270	FP376.5	TMQ-12	TVLS-4760.2*	
B	■16	450			BR2045	TC75			
C	▲16	450							
D	16	450							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA BELL SOUND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	33		N750 10%	24B26	N750-DI 33	DTN-33	C10Q33U	CN7-433	5TCU-Q33S 10%*	
C4	3.3		NPO 10%	24B30	NPO-DI 3.3	DTZ-3R3	C10V33U	CNO-533	5TCCB-V33S 10%*	
C5	12		NPO 10%	24B27		TCZ-12	C10Q12C	CNO-412	5TCC-Q12S 10%*	
C6	220		10%	24B23	DI-220	D6-221	L10T22	JL-322	5GA-T22S 10%*	
C7	220		10%	24B23	DI-220	D6-221	L10T22	JL-322	5GA-T22S 10%*	
C8	4.7		NPO	24B31	NPO-DI 4.7	DTZ-4R7	C10V47C	CNO-547	5TCCB-V47	
C9	2000		10%	B-20141-P15	DI-2000		PM6D2	JL-220	6TM-D2	
C10	47		N750 10%	24B29	N750-DI 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47S 10%*	
C11	220		10%	24B23	DI-220	D6-221	L10T22	JL-322	5GA-T22S 10%*	
C12	27		NPO 10%	24B72	NPO-DI 27	DTZ-27	C10Q27C	CNO-427	5TCC-Q27S 10%*	
C13	10		N470 10%	24B71						
C14	1.5-10			25A9		829-10				
C15	3000		10%	B-20141-P12	DI-3000		PM6D3	GTM-623	6TM-D3	
C16	2000		10%	B-20141-P15	DI-2000		PM6D2	JL-220	6TM-D2	
C17	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C18	.047	50		28B1			PM2S47	GTM1147	2TM-S47	
C19	10		N750	24B52	N750-DI 10	DTN-10	C10Q1U	CN7-410	5TCU-Q1	
C20	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C21	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C22	3000		10%	B-20141-P12	DI-3000		PM6D3	GTM623	6TM-D3	
C23	2.2		NPO +.25mmf	24B33		DTZ-2R2	C10V22C	CNO-522	5TCCB-V22S+.25 mmf*	
C24	4.7		NPO	24B31	NPO-DI 4.7	DTZ-4R7	C10V47C	CNO-547	5TCCB-V47	
C25	100		N750 10%	B-20141-P18	N750-DI 100	DTN-100	C10T1U	CN7-310	5TCU-T1S 10%*	
C26	2000		10%	B-20141-P15	DI-2000		PM6D2	JL-220	6TM-D2	
C27	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C28	20		N470 10%	24B73						
C29	3000		10%	B-20141-P12	DI-3000		PM6D3	GTM-623	6TM-D3	
C30	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C31	47		N750 10%	24B29	N750-DI 47	DTN-47	C10Q47C	CN7-547	5TCU-Q47S 10%*	
C32	270		10%	24B74	DI-270	D6-270	L10T27		5GA-T27S 10%*	
C33	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C34	100		N750 10%	B-20141-P18	N750-100	DTN-100	C10T1U	CN7-310	5TCU-T1S 10%*	
C35	750		10%	24B59	DI-750			JL-375	5GA-T75S 10%*	
C36	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C37	330		10%	B-20141-P24	DI-330	D6-331	L10T33	JL-333	5GA-T33S 10%*	
C38	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C39	180		10%	24B4	DI-180	DD-181	L10T18		5GA-T18S 10%*	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA BELL SOUND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C40	1000			24B41	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C41	470		10%	24B60	DI-470	D6-471		JL-347	5GA-T47S 10%*	
C42	3000		10%	B-20141-P12	DI-3000		PM6D3	GTM-623	6TM-D3	
C43	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C44	4000		10%	B-20141-P20			PM6D4	GTM-624	6TM-D4	
C45	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C46	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C47	200		10%	B-20141-P31	DI-200	DD-201	L10T2		5GA-T2S 10%*	
C48	2000		10%	B-20141-P15	DI-2000		PM6D2	JL-220	6TM-D2	
C49	1000			24B41	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C50	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C51	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C52	220		10%	24B23	DI-220	D6-221	D6-221	L10T22	5GA-T22	
C53	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C54	750		10%	24B59	DI-750			JL-375	5GA-T75S 10%*	
C55	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C56	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C57	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C58	3000		10%	B-20141-P12	DI-3000		PM-6D1	GTM-623	6TM-D3	
C59	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C60	10		NPO 10%	24B52	NPO-DI 10	DTZ-10	C10Q1C	CNO-410	5TCC-Q1S 10%*	
C61	10000			24B37	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	

① Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BELL SOUND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	15B26					Volume. Tap ⓐ 50K
B	Switch							Push-Pull(Power)
R2A	2meg	½	15B27	F1-68		† QJ-1105	* UE4012	Bass
B	2meg	½		R2-68				Treble
R3	100Ω	½	15B29	B-1			U1	Hum Balance

† "Concentrikit" equivalent: K-2 Kit with base elements & shafts: B13-139, P1-020 (Panel) B13-139, R1-100 (Rear)

* "STA-LOC" equivalent: FA26A, RU26A, OS625, IK937

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	BELL SOUND PART No.	NOTES
R4	47K			
R5	270Ω			
R6	10K			
R7	1000Ω			
R8	1meg			
R9	1meg			
R10	3.3meg			
R11	220K			
R12	470Ω			
R13	47K			
R14	1000Ω			
R15	680Ω			
R16	2200Ω			
R17	100Ω			
R18	56K			
R19	1000Ω			
R20	1meg			
R21	2200Ω			
R22	100Ω			
R23	2.2meg			

ITEM No.	RATING OHMS	RATING WATT	BELL SOUND PART No.	NOTES
R24	47K			
R25	22K			
R26	100K			
R27	100K			
R28	100K			
R29	100K			
R30	120K			
R31	68K			
R32	470K			
R33	10K			
R34	56K			
R35	470K			
R36	270K			
R37	270K			
R38	3.3meg			
R39	1meg			
R40	680Ω			
R41	4.7meg			
R42	4.7meg			Note 1
R43	470K			

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	BELL SOUND PART No.	NOTES
R44	22K			
R45	220K			
R46	22K			
R47	27K			
R48	100K			
R49	470Ω			
R50	1meg			
R51	100K			
R52	1500Ω			
R53	10K			
R54	1meg			
R55	68K			
R56	680Ω			
R57	68K			
R58	470K			
R59	150Ω	5		
R60	470K			
R61	150K			
R62	15K			
R63	820Ω	2		
R64	80Ω	5		
R65	6000Ω	10	14A3	

Note 1. Not used in some versions

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA BELL SOUND PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.	32B18						
L2	RF Choke	31A23	19-2002	19-2002		4582		.15uh
L3	RF Choke	31A24	19-2006	19-2006	BC-560	4590		.68uh
L4	FM RF Coil	31B25						
L5	RF Choke	31A24	19-2006	19-2006	BC-560	4590		.68uh
L6	FM Osc. Coil	31B4						
L7	RF Choke	31A22	19-1002	19-1002	BC-563	4606		2.5uh
L8	Loopstick	31X2						
L9	RF Choke	31A24	19-2006	19-2006	BC-560	4590		.68uh
L10	AM Osc. Coil	31A1						
L11	RF Choke	31A24	19-2006	19-2006	BC-560	4590		.68uh
L12	1st FM IF Trans.	32C44	16-3487	16-3487	FM-254	1463		
L13	1st AM IF Trans.	32C25	16-6758	16-6758	BC-352	12-C1	RF-1	
L14	2nd FM IF Trans.	32C24	16-3487	16-3487	FM-254	1463		
L15	2nd AM IF Trans.	32C25	16-6758	16-6758	BC-353	12-C2	RF-2	
L16	3rd FM IF Trans.	32C24	16-3487	16-3487	FM-254	1463		
L17	Fil. Choke	31A21	19-1003	19-1003	BC-564	4608		3.8uh
L18	Discriminator	32C60	17-3494	17-3494	FM-253	1464		
L19	Line Choke	31B8						1.4uh
L20	Line Choke	31B8						1.4uh

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA BELL SOUND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1A	570 VCT @ .130A	6.3V @ 3.6A	32B38						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2.4A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA BELL SOUND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6400Ω CT Screen Taps @ 1200Ω CT	16Ω Taps @ 8Ω, 4Ω	32B40							

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA BELL SOUND PART No. FUSE	BELL SOUND PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	3A 125V	B-20043-P4	B-20001-P17	313003, (3AG 3A 125V)	342001	MDX3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	BELL SOUND PART No.	NOTES
M2	Tuning Cap	25B7	FM-AM, 4 Gang
M3	Switch	43B33	Selector (Rotary)
M4	Switch	B-20219P7	* Rumble Filter Off-On (SPDT, Slide Type)
M5	Switch	B-20219P7	Loudness) (SPDT, Slide Type)
M6	Switch	B-20219P6	Speaker Selector (DP3T, Slide Type)

* Not used in some versions.

CABINETS & CABINET PARTS

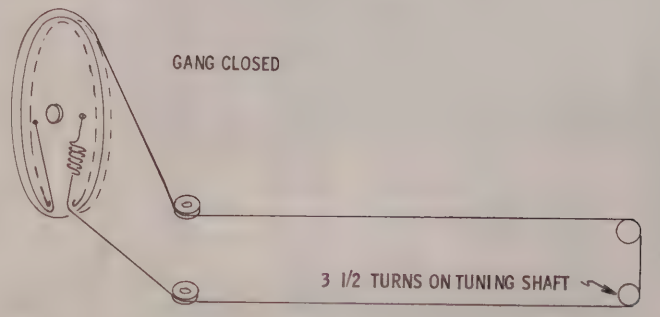
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	26A0380-P1	Tuning
Knob	26A0380-P3	Volume
Knob	26B0379-P1	Bass Selector (Compensation)
Knob	26B0379-P2	Treble, Selector FM-FM AFC-AM
Dial Pointer	72A50	
Dial Glass	36A32	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



DIAL CORD STRINGING

PHOTOFACT* Folder

EIA MEMBER

COLUMBIA MODEL 360

COLUMBIA MODEL 360

COLUMBIA MODEL 360

TRADE NAME	Columbia Records Model 360
MANUFACTURER	Columbia Records, 799 Seventh Ave., New York 19, N. Y.
TYPE SET	AC Operated 3 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 35 Watts, .37 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE V-M 1200A — PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Right Channel AF Amp- Left Channel AF Amp.	12AX7	

ITEM No.	USE	TYPE	NOTES
V2	Right Channel Output	50C5	
V3	Left Channel Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	11A710	PRS150V80-50	BBRD8515	TCD498	TDLD-12	TVA-2462	
B	50	150							
C2	25	25	①	XPP25025	BBR25-25	TC26	TD25-25	TE-1207	
C3	25	25	①	XPP25025	BBR25-25	TC26	TD25-25	TE-1207	
C4	100	25NP	11A721	PRS25VNP100	BR2502 †	TCN425		TVAS-1207.1*	
C5	100	25NP	11A721	PRS25VNP100	BR2502 †	TCN425		TVAS-1207.1*	
C6	100	25NP	11A721	PRS25VNP100	BR2502 †	TCN425		TVAS-1207.1*	

① Some versions may use 20mfd in this application (Part #11A739).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA COLUMBIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C7	500				SI 500	D6-501	BYA10T5	UC-535	5GA-T5	
C8	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C9	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	500				SI 500	D6-501	BYA10T5	UC-535	5GA-T5	
C12	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C13	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C14	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.25meg	½	9A596	B-85		Q13-140	UE3971	Loudness, Left Channel
B	3.25meg	½		SR-85		M13-140		Loudness, Right Channel
R2A	500K	½	9A597	B-59		Q11-133	UE1295	Treble, Left Channel
B	500K	½		SR-59		M11-133		Treble, Right Channel
R3A	10K	½	9A598	B-14	A47-10K-S	Q11-116	U20	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	COLUMBIA PART No.	NOTES
R4	10meg			
R5	33K 5%			Note 1
R6	270K			
R7	470K			
R8	100Ω	1		
R9	10meg			
R10	33K 5%			Note 1

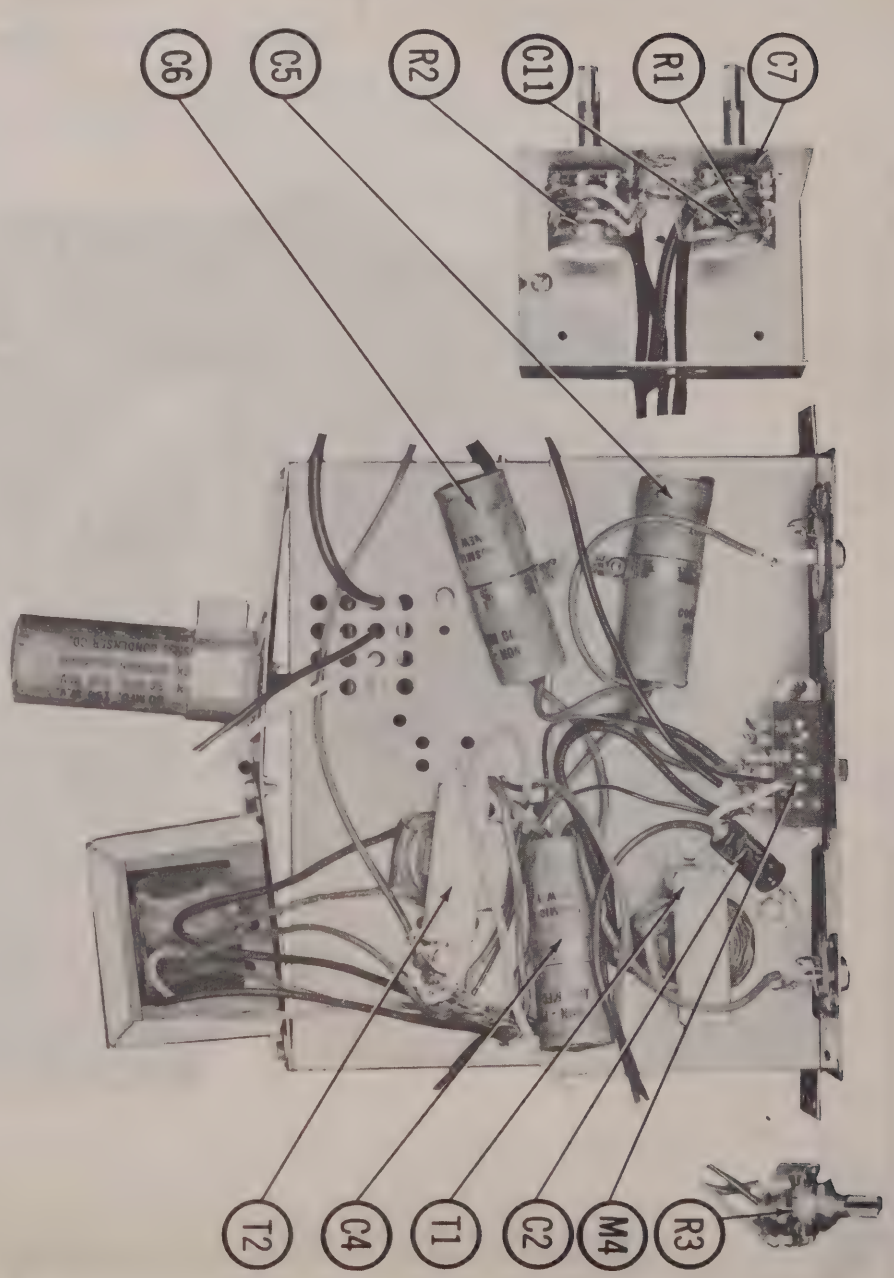
ITEM No.	RATING OHMS	RATING WATT	COLUMBIA PART No.	NOTES
R11	270K			
R12	470K			
R13	1000Ω			
R14	50Ω	5	16A402	Note 2
R15	47Ω			Note 4
R16	47Ω	1		Note 3

Note 1. Some versions may use 27K in this application.
Note 2. Some versions may use 47Ω in this application.
Note 3. Some versions may use 39Ω in this application.
Note 4. Not used in some versions.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L1		.5Ω	.0035 HY	21A208						

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4500Ω CT	6-8Ω CT	3A232							
T2	1400Ω	1-2Ω	3A233							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA COLUMBIA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	1A104	6A1	
SP2	6"	PM	3-4Ω	1A104	6A1	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA COLUMBIA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.065A	10A608 ①	1101A①	RS100A ①	100A① M150		① Selenium ② Silicon

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA COLUMBIA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M2		13-TB *				* Includes needles & mounting mechanism

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA COLUMBIA PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M3		S69X † or S69XSD †♦ or S69XDD ♦	* W-103STSS † or * W-103STDS ♦†	* Includes Cartridge † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M4	Switch	19AC25	Mono-Stereo (DPDT, Slide Type)

CABINETS & CABINET PARTS

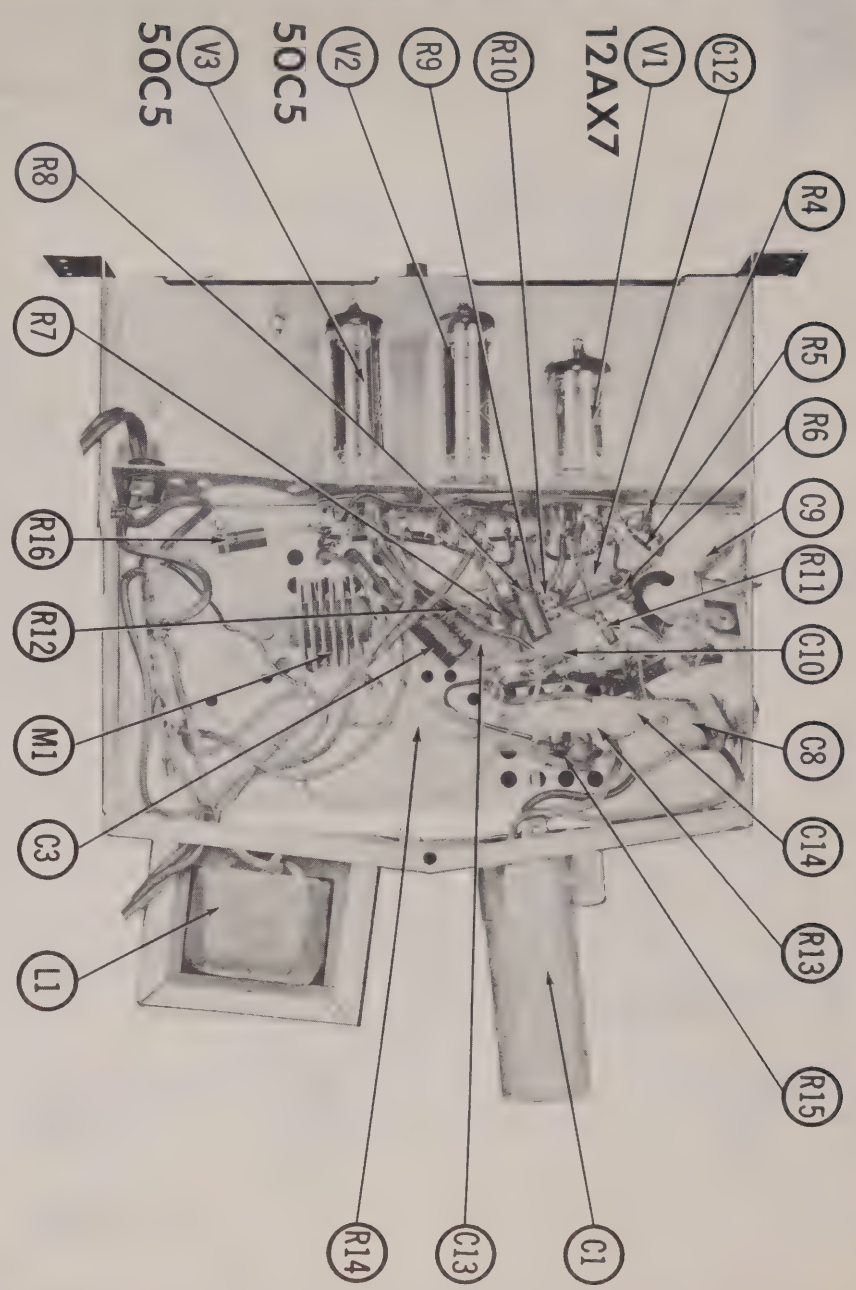
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

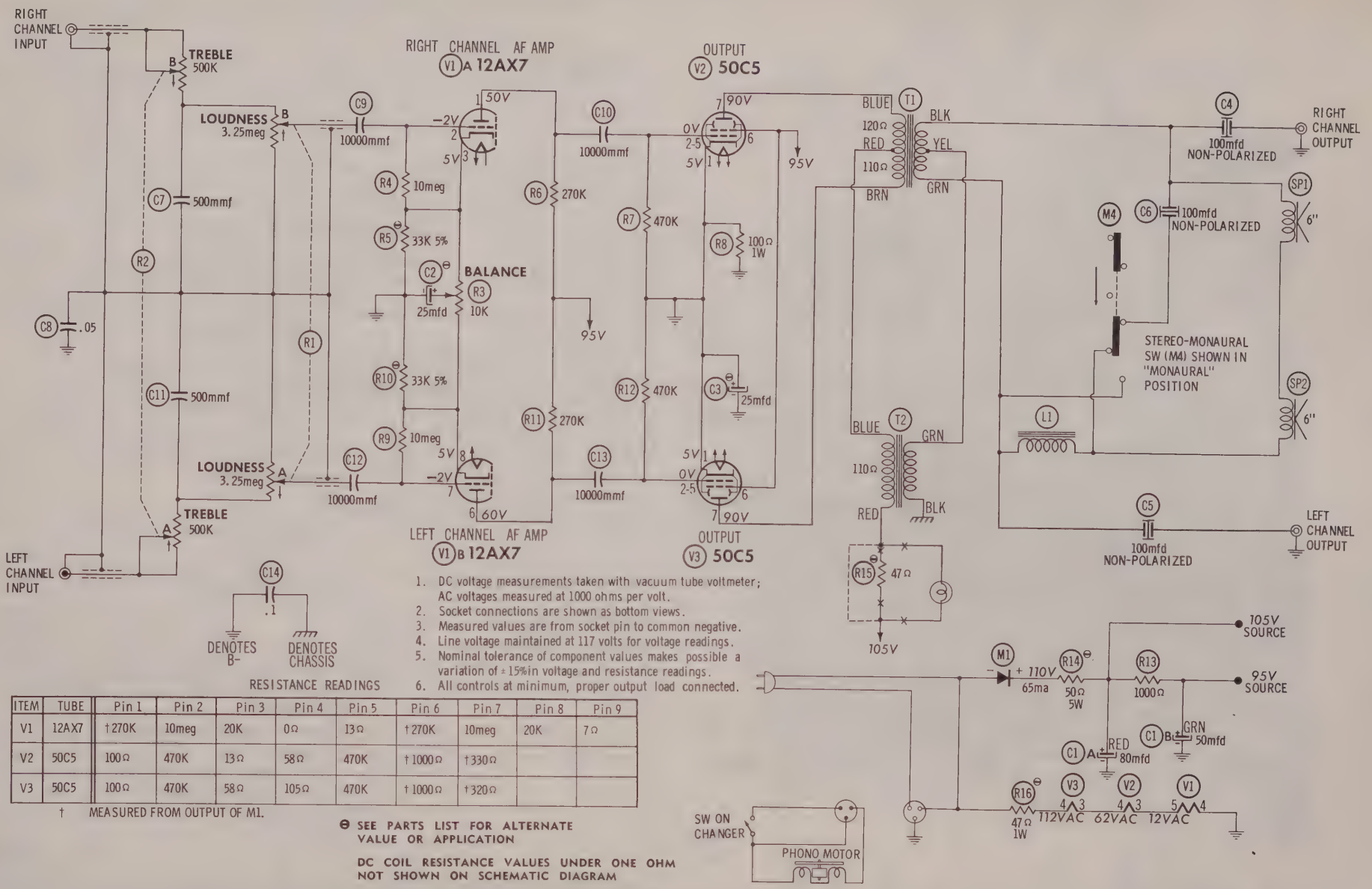
NAME	PART NO.	DESCRIPTION
Knob	8A462	Control
Cabinet	17A955	Mahogany
Cabinet	17A956	Blonde

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†270K	10meg	20K	0Ω	13Ω	†270K	10meg	20K	7Ω
V2	50C5	100Ω	470K	13Ω	58Ω	470K	†1000Ω	†330Ω		
V3	50C5	100Ω	470K	58Ω	105Ω	470K	†1000Ω	†320Ω		

† MEASURED FROM OUTPUT OF M1.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

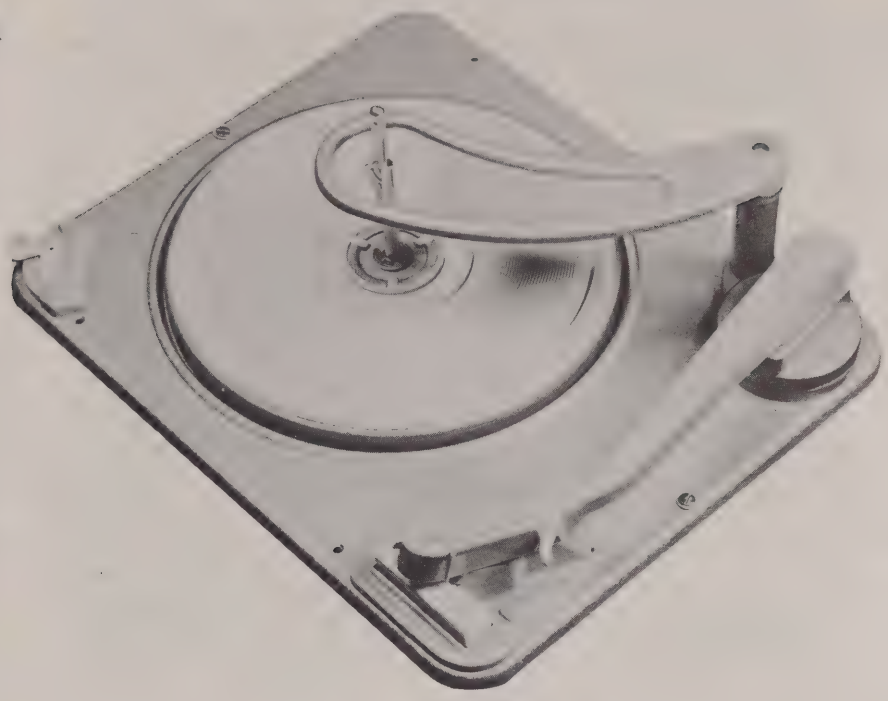
©Howard W. Sams & Co., Inc. 1959

COLUMBIA MODEL 360

PHOTOFACT* Folder

ELECTRONIC INDUSTRIES ASSOCIATION EIA MEMBER

DUAL MODEL 1004



DUAL MODEL 1004

DUAL MODEL 1004

GENERAL INFORMATION

The Dual Models 1004 and 1004S record changers play standard 78-, 45-, 33 1/3- and 16 2/3- rpm records. Records up to and including 12 inches in diameter can be played.

The Dual Model 1004 is a monaural record changer; the Dual 1004S is a stereo record changer.

The Dual record changers play a stack of records in automatic sequence and shut off after the last record. The changer will automatically change up to ten intermixed records of any size, provided they are 78's or LP's of the same speed.

A voltage selector permits voltage changes for 110/125, 150/160, or 220/240 volts. It can be reached through the holes of the turntable underneath the rubber mat. (There is no voltage selector on the Canadian Models.) Special drive pulleys are required to change the frequency to 40 or 50 cycles.

The setdown of the tone arm is determined by the pickup. The pickup scans the surface of a record with the indexing wheel. The indexing wheel retracts after it drops off the edge of a record. The needle will then drop into the lead-in groove of the record.

Manufactured by:

Gebruder Steidinger
St. Georgen, Black Forest
West Germany

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS 6, INDIANA

C399

Copyright 1959 • All Rights Reserved

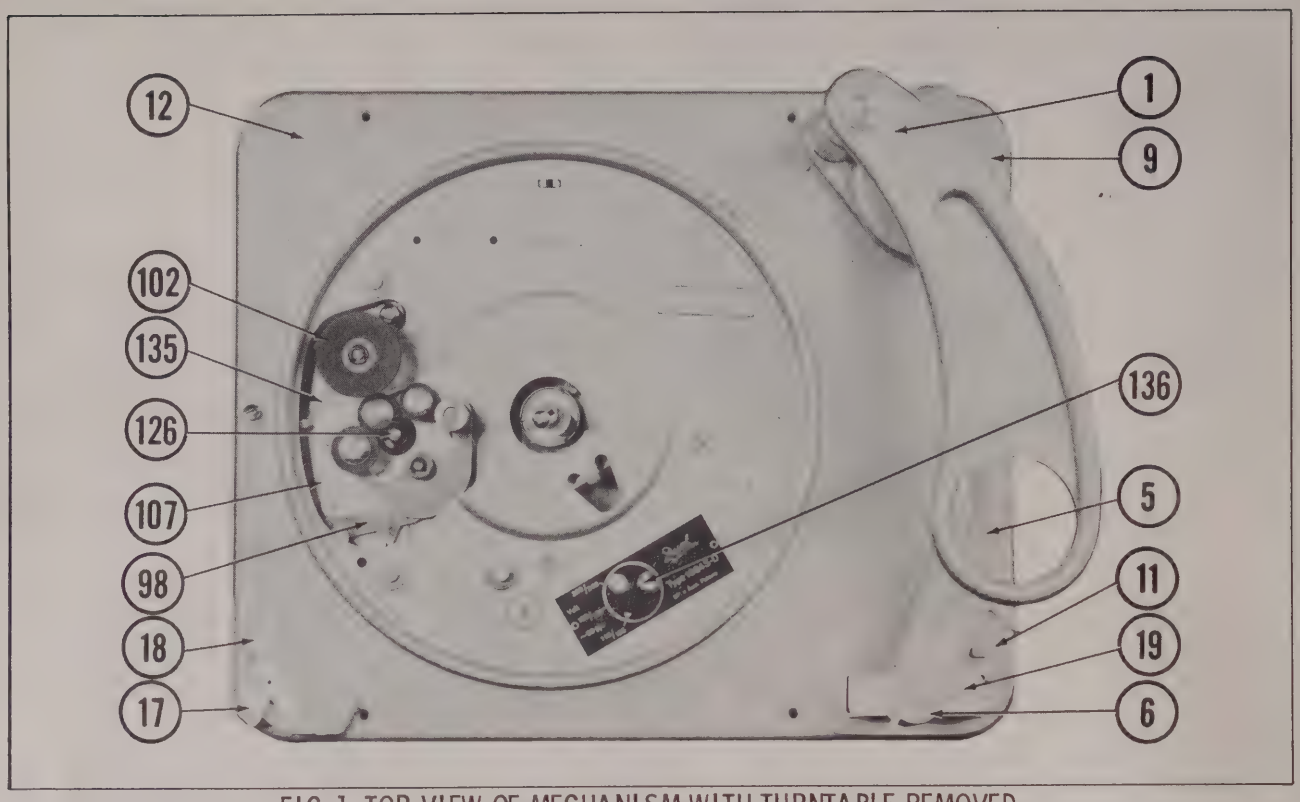


FIG. 1 TOP VIEW OF MECHANISM WITH TURNTABLE REMOVED

PREPARING FOR OPERATION

The record changer must be absolutely level. To level the changer, use a torpedo or similar level on the record changer baseplate, and adequate shims to obtain level reading on level.

NOTE: Changer installed in cabinet cannot be operated unless the spring mounting is properly released. Therefore the two transit screws must be removed to free the changer.

OPERATING INSTRUCTIONS

For Records with a Small Center Hole

1. Lift overarm (1) and move it outward.
2. Insert thin center spindle (14) and lock it in place.
3. Load up to ten records, either all LP of the same speed or all 78 records. Records may be any size.
4. Select the proper speed.
5. Select the proper needle for the record to be played.
6. Depress the Start button. This unlocks the tone arm and switches on the motor.
7. After all records have been played, the tone arm returns to its rest position and locks itself. The changer then shuts off automatically.
8. To play the other side of records, lift them off the spindle and turn them over. Reload records and depress Start button.
9. To reject a record at any time, depress the Start button.
10. To stop the changer, depress the Stop button. The tone arm will return to its rest position and the changer will shut off.
11. To repeat a record, depress the Repeat button.
12. To stop the changer without changing the record, depress the Stop and Repeat buttons simultaneously.
13. To repeat a record before it has finished playing, depress the Start and Repeat buttons simultaneously.

For Records with a Large Center Hole (7-Inch, 45-rpm Records)

1. Replace thin center spindle (14) with AS3 45-rpm spindle.
2. Repeat steps 1 through 13 in the previous paragraph, "For Records with a Small Center Hole".

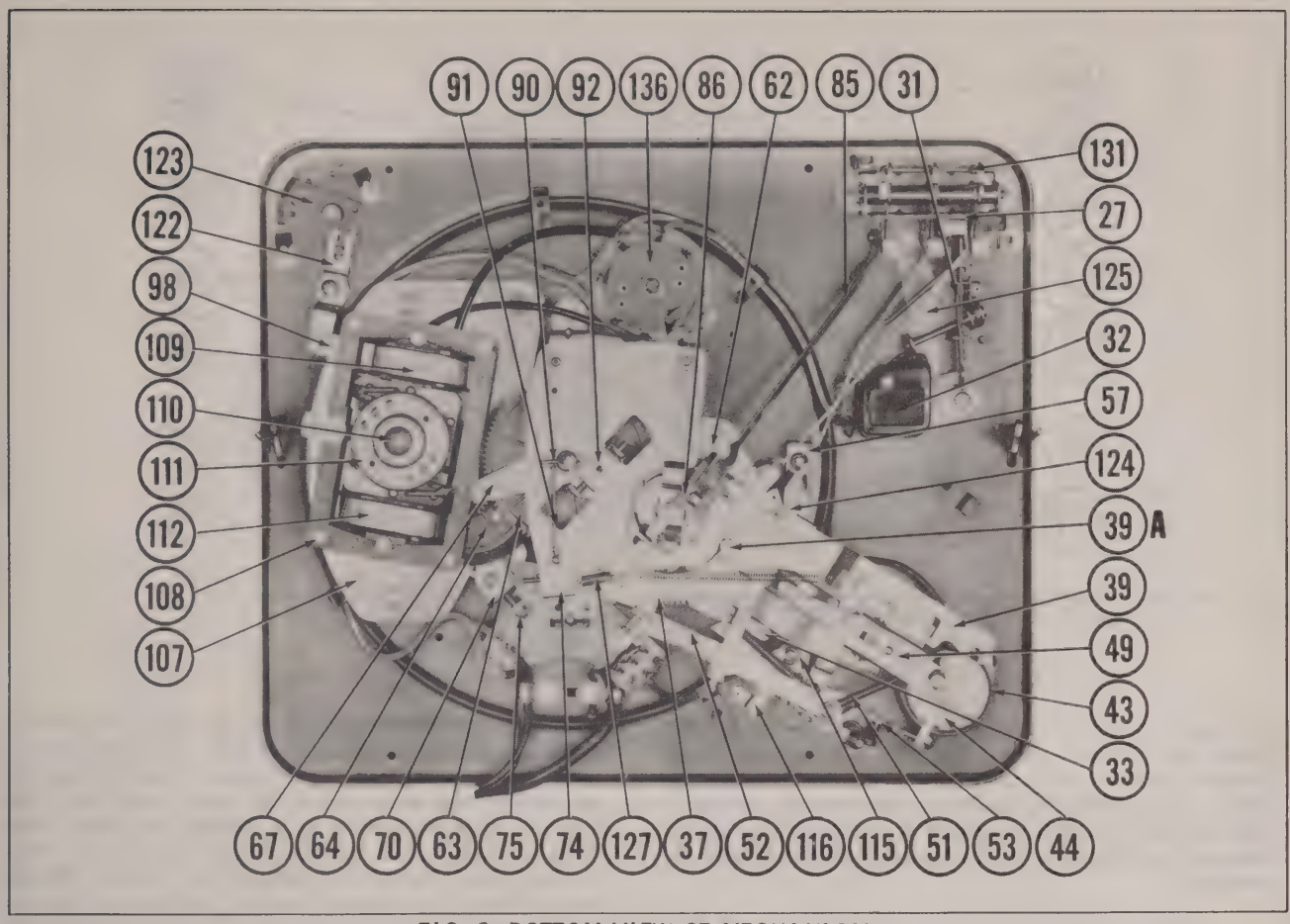


FIG. 2 BOTTOM VIEW OF MECHANISM

Single-Play Operation

1. Move overarm (1) outward.
2. Insert the short thin spindle.
3. Place a record on the turntable.
4. Select the proper speed for the record to be played.
5. Select the proper needle for the record to be played.
6. Depress the Start button.
7. When playing records with a large center hole (45-rpm records), use the disc adapter.

NOTE: The Stereo button must be set to the Stereo position before stereo can be reproduced.

CHANGE CYCLE

Observe the change cycle by depressing the start button and rotating intermediate wheel (63) by hand. The following action can then be readily observed, and the function of each part can be more easily understood.

The automatic trip mechanism operates on the velocity trip principle. The faster inward movement of the tone arm after it reaches the lead-out groove of the record, trips the mechanism.

Trip assembly (57), connected to the tone arm through a clutch assembly, moves with the tone arm. The tracking speed of the needle in the playing groove is not fast enough for trip assembly (57) to engage striker cam (16). As long as the tracking speed is constant, rotating striker cam (16) will continue to push trip assembly (57) back and out of engagement. However, after the needle enters the lead-out groove at the end of the record, the velocity of the tone arm increases. As a result, trip assembly (57) engages and pulls striker cam (16) forward. Switch lever (60), connected to trip assembly (57), is pushed forward and contacts engage lever (74). Engage lever (74) is forced away from cam set (62), which is now free to rotate. Engage lever (74) also forces engage bracket (70) and engage pin assembly (88) forward. As a result, drive wheel (64) is moved into contact with the motor shaft.

Drive wheel (64), which contacts the motor shaft, drives the intermediate wheel (63). Intermediate wheel (63) drives cam set (62). Cam set (62) moves main rail (38) toward the clutch assembly. Main rail (38), moving toward the clutch assembly, forces lifting lever

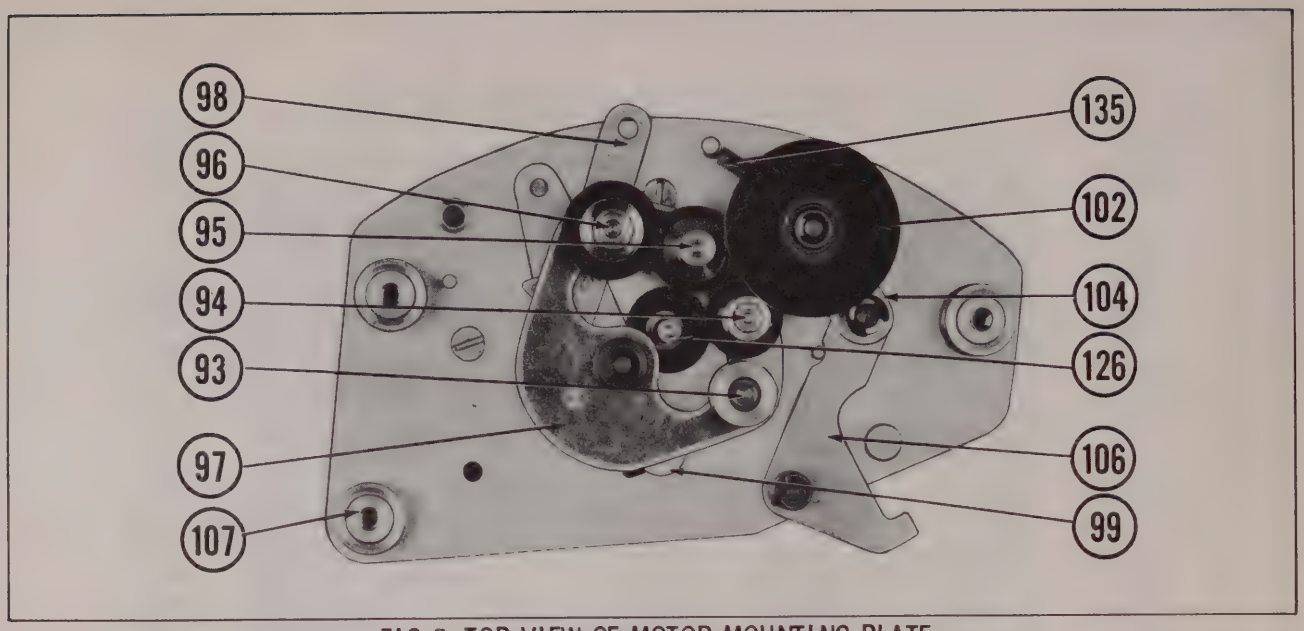


FIG.3 TOP VIEW OF MOTOR MOUNTING PLATE

(49) up the incline on main rail (38). Lifting lever (49) pivots and contacts lifting stud (8). Lifting stud (8) is forced upward and contacts the tone arm. As a result, the tone arm is lifted from the record. As lifting stud (8) is forced upward the clutch assembly, consisting of clutch disc (43) and clutch plate (44), is engaged.

Main rail (38) continues toward the clutch assembly until it contacts clutch plate (44). Clutch plate 44 is forced backward, and the tone arm is moved toward cover plate (11).

The changing of a record is started by the rotation of cam set (62). The bottom of cam set (62) actuates dropping lever (92) and changing bolt (90). Changing bolt (90) is forced upward by the action of dropping lever (92) riding up the incline on cam set (62). Changing bolt (90) forces thin center spindle (14) to drop a record on the turntable.

As the tone arm is moved back to cover plate (11), the indexing system in the pickup head is triggered. The horizontal movement of the tone arm is then activated by feeler arm (39), which is also driven by cam set (62). Feeler arm (39) and main rail (38) move the tone arm out, over the record.

The tone arm will set down approximately three inches from thin center spindle (14). The clutch is disengaged by the action of lifting lever (49) riding down the incline on main rail (38). The tone arm is now free to index the record size. Feeler arm (39) moves the tone arm toward the cover plate (11). The movement of the tone arm is damped by brake lever (52), which presses against clutch plate (44). When the tone arm reaches the edge of the record, the indexing device is actuated, and the needle sets down in the lead-in groove of the record. The tone arm is now free to track across the record.

The mechanism follows the preceding sequence of cycling and playing each record until all but the last record in the stack has been played.

As the last record of the stack drops to the turntable, overarm (1) drops below the shelf on thin center spindle (14). End shut-off finger (116) engages the notch on the shaft of overarm (1) when the shaft is fully seated. This action pivots switch lever actuating lever (33). When the tone arm enters the record lead-out grooves, switch lever actuating lever (33) comes forward with main rail (38) and contacts switch lever (115) on the opposite side. Feeler arm (39) is disengaged from clutch plate (44) by action of the link between switch lever (115) and feeler arm (39). The tone arm, no longer engaged with feeler arm (39), will rest on cover plate (11) and will now lock; and the unit will automatically shut off.

FUNCTION OF THE INDIVIDUAL COMPONENTS

Turntable Drive

A friction drive wheel (102) for the four speeds - 78, 45, 33, and 16 rpm - is located under the turntable. The four intermediate wheels (93), (94), (95), and (96) contact the motor shaft and the drive wheel (102). If an intermediate wheel must be replaced, always replace the complete wheel not just the rubber ring. Drive wheel (102) is automatically disengaged in the rest position, so that pressure marks are avoided on the rubber surface.

In the neutral position of the Speed Selector, all intermediate wheels 93, 94, 95, and (96) become disengaged. The changer should always be placed in the neutral position when not in use.

To avoid slippage in the drive, keep all grease and oil away from the rubber friction wheels. Otherwise, wow due to uneven turntable speed will result.

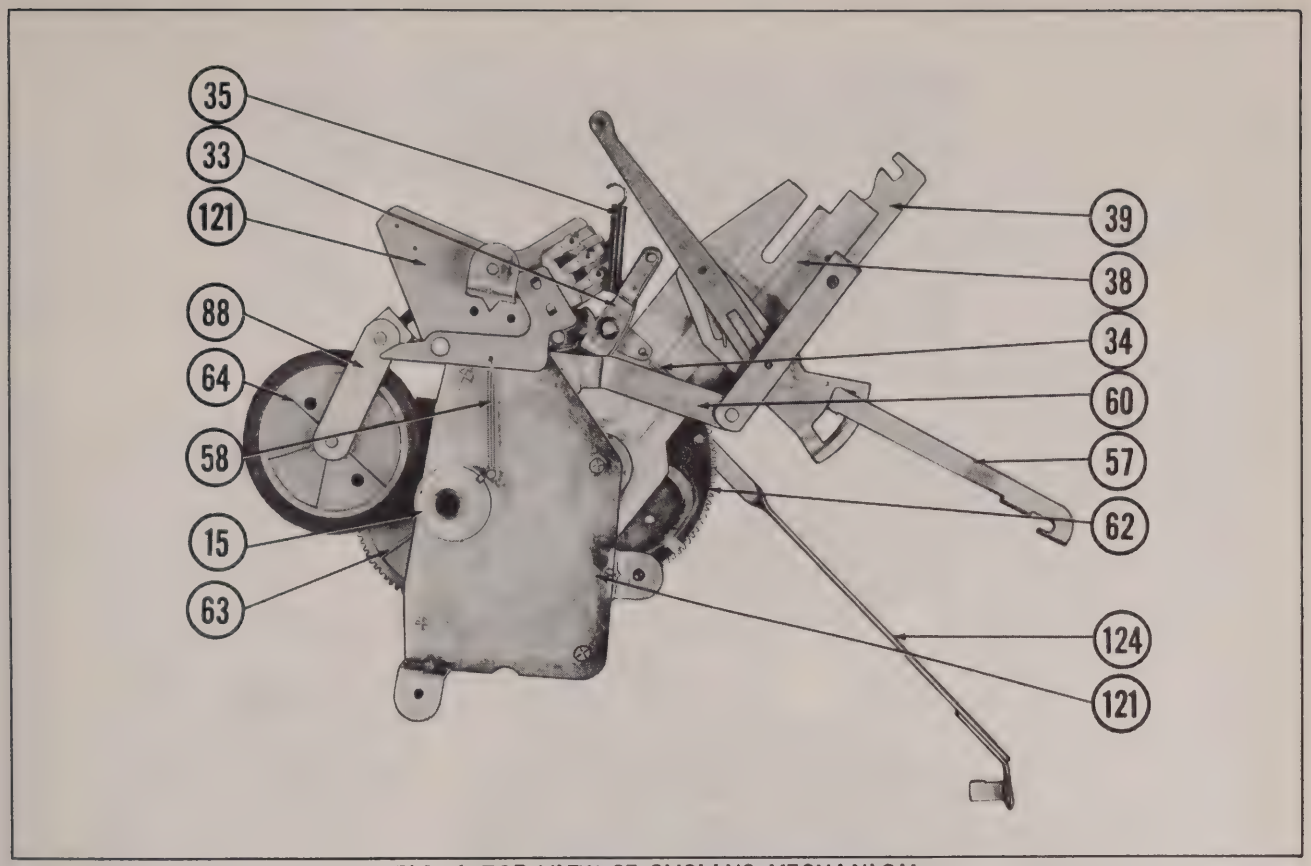


FIG. 4 TOP VIEW OF CYCLING MECHANISM

Muting Switch

The changer is equipped with a muting switch so that noise is not reproduced during the change cycle. This switch shorts the pickup leads and thus temporarily cuts out the amplifier. The knife contacts are driven by engage lever (74) and rail (87). They are forced between the spring contacts as long as cam set (62) is rotating.

Push-button Control

The different functions, such as Start, Stop and Repeat, are controlled by the push buttons at the right front of the unit. They are coupled with locking level (29), which locks the tone arm, and power switch (32). Control links (37), (85), and (124) connect the push buttons to the mechanism.

ADJUSTMENTS

Tone Arm Pressure Adjustment

The tone arm pressure should be between eight and nine grams. Pressure adjustment screw (9A) is located at the front of the tone arm base.

Tone Arm Height Adjustment

The tone arm height can be adjusted by adjustment screw (81). There should be approximately 1/8 inch between the lowest record of the stack and the tone arm when the arm moves to the center of the turntable.

Set-down Adjustment

When the tone arm is indexing the size of the record, the correct set-down point of the tone arm is approximately three inches from the center of the record. Adjusting eccentric screw (39A) will correct the set-down position. Difficulties will be encountered with a seven-inch record if the tone arm touches down outside a circle of 6 7/8 inches in diameter. If the tone arm sets down too far toward the inside of record, the automatic trip mechanism will be activated. As a result, the record will change continually without playing.

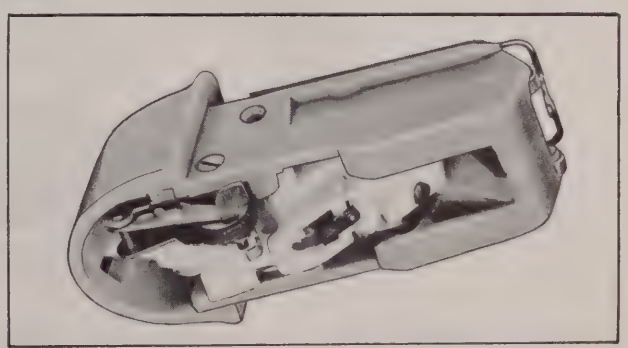


FIG. 5 CARTRIDGE ASSEMBLY

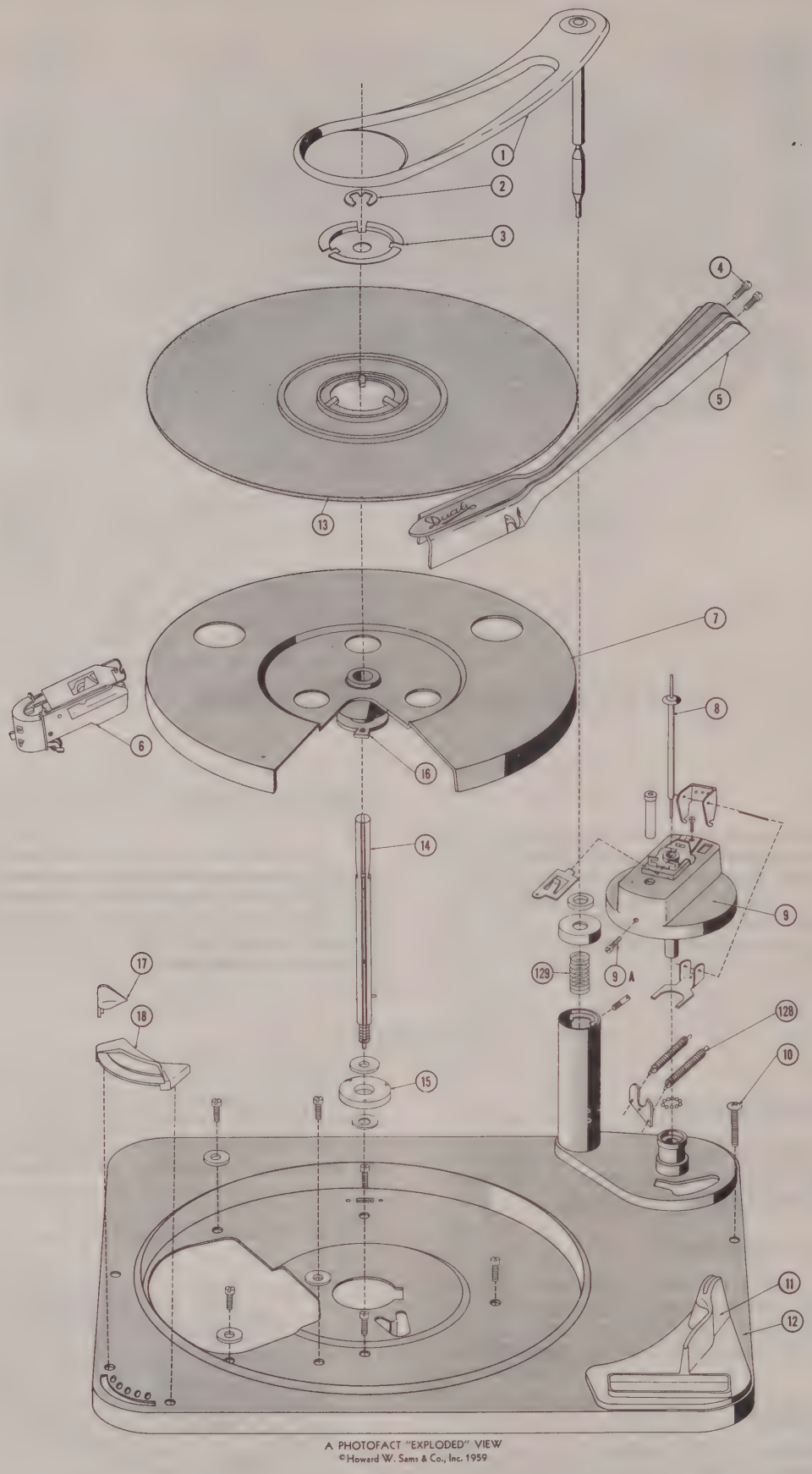


FIG. 6A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

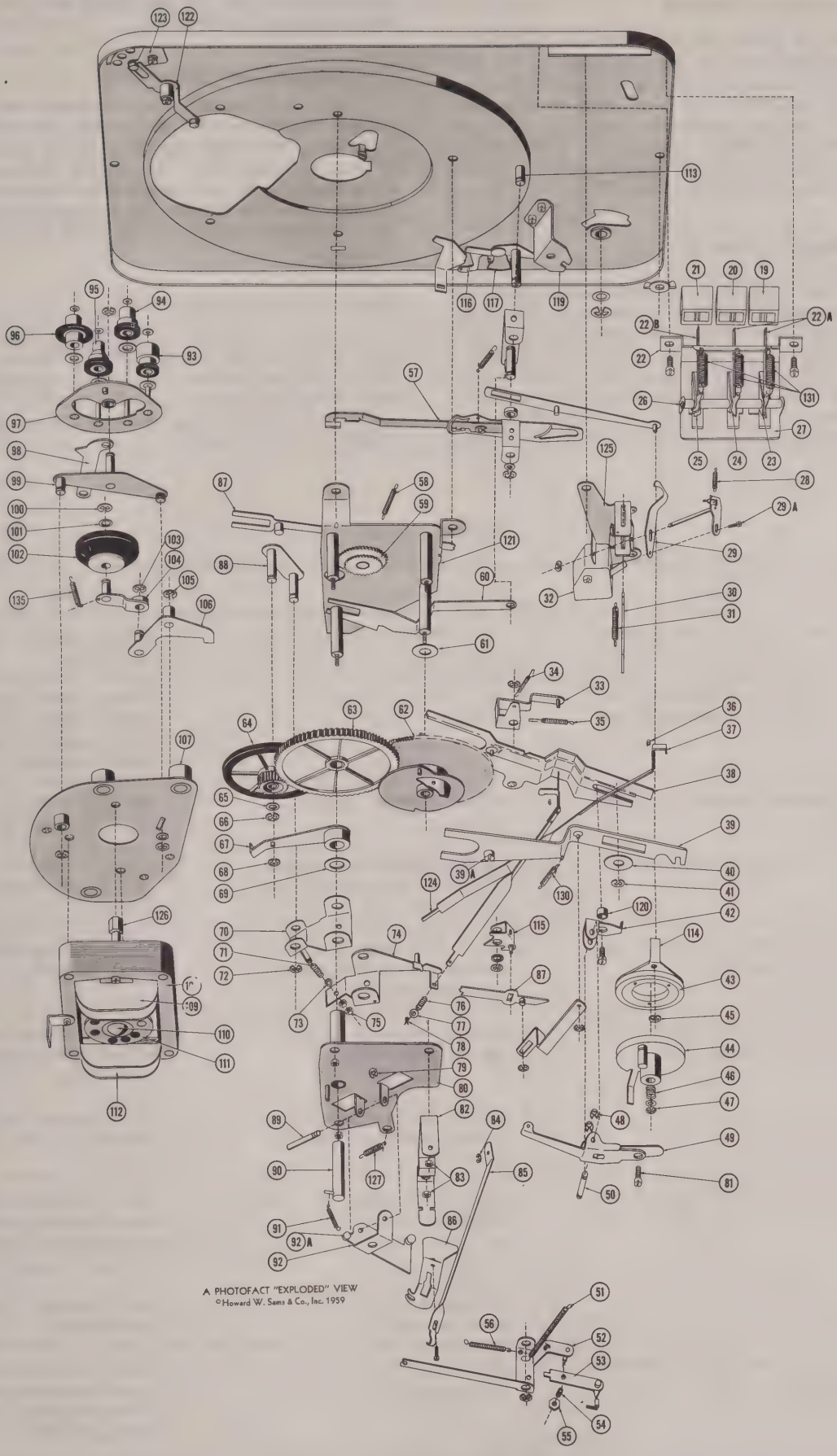


FIG. 6B EXPLODED VIEW OF PARTS BELOW BASEPLATE

Tone Arm Locking Adjustment

Before the tone arm can lock automatically, locking lever (29) must be able to easily enter the cutout of the tone arm. Therefore, the horizontal movement of the tone arm must first be adjusted. Loosen the two set screws holding stop piece (114) and adjust for proper horizontal movement. The vertical tolerance is approximately 1/16 inch and can be obtained by means of adjusting screw (29A).

Tone Arm Brake Adjustment

The brake is adjusted correctly when a force of four to six grams is required to move the tone arm horizontally while the brake is engaged. To measure the force remove the pickup head and connect a measuring scale (spring scale) to the extreme front end of the tone arm. The braking power can be adjusted by means of brake link adjustment nut (55). When the brake is disengaged, the distance between the brake lining of brake link (53) and clutch disc (43) should be approximately 3/64 inch.

Drive Engage Lever Adjustment

In order that the required power can be transmitted from the motor shaft to the gear mechanism, drive wheel (64) must engage the motor shaft by means of engage lever (74). Adjust the two engage lever adjusting nuts (75) until there is a distance of approximately 1/16 inch between the rubber surface of drive wheel (64) and the motor shaft in the out-of-cycle position.

Record Dropping Adjustment

Changer bolt (90) is adjusted by means of eccentric adjustment screw (92A). Changer bolt (90) should drop the records without any tendency of jamming on the highest point of cam set (62). The changing spindle must be inserted and locked before this adjustment can be made.

TROUBLE CHART

Symptom	Cause	Remedy
Changer does not start when Start button is depressed.	1. No voltage supply to motor.	1. Check switch (32) for continuity.
Voltage supply, and switch (32) functioning, but changer will not start.	1. No voltage supply to motor.	1. Voltage selector not engaged. Make sure it is fully seated in appropriate position.
Tone arm moves, but turntable does not revolve.	1. Speed control is still at zero.	1. Move Speed Control knob (17) to desired speed.
Turntable revolves at wrong speed.	1. Motor pulley (126) incorrect for frequency of local supply.	1. Change motor pulley (126) to the proper frequency.
Tone arm lifts and returns to its rest without playing record.	1. Tone arm had been returned to rest manually at previous playing.	1. Stop changer and depress Start button first.
With thin record spindle (14) in use, several records drop at once.	1. Lowest record in the stack is out of position. 2. Safety latch is pushed upwards on record spindle.	1. Remove stack of records and replace them evenly on spindle. 2. Push latch at top end of spindle to its lowest position.
Turntable loses speed as record drops.	1. Record spindle is not locked. 2. Dropping lever (92) has too much lift.	1. After inserting changer spindle into center hole, turn spindle until it clicks into place. 2. See "Record Dropping Adjustment".
Does not drop records, or drops them improperly.	1. Dropping lever (92) does not move freely. 2. Spindle (89) for dropping lever (92) is broken.	1. Make sure hole in thin center spindle(14) is free of obstructions (bits of labels, etc.) 2. Replace spindle (89) for dropping lever (92).

Symptom	Cause	Remedy
Repeat does not work.	1. Dropping lever (92) is still operating.	1. Adjust release link (86).
Stop mechanism fails to work.	1. Switch lever (115) not being released.	1. Switch lever actuating lever (33) is impeded. Check tension spring (34) under main rail (38).
Tone arm does not lower to its rest properly, and motor continues to run.	1. Locking lever (29) does not engage recess in tone arm.	1. Adjust stop piece (114) and locking lever (29), as described under "Tone-Arm Locking Adjustment".
Turntable does not attain correct speed.	1. Improper AC frequency.	1. Check AC frequency. If necessary, use a motor pulley (126) designed for the proper frequency.
	2. Slipping drive.	2. Clean all oil and grease from friction surfaces of drive wheels (93), (94), (95), (96), and (102).
	3. Friction in motor bearing or drive wheel bearings.	3. Clean and oil the bearings in the motor or in the drive wheels.
Changer drops several records in succession without playing them.	1. Trip mechanism engages too soon.	1. Move setdown position of indexing wheel outwards by means of adjusting screw (39A). See "Set-down Adjustment".
	2. Cam set (62) does not stop after revolving 360°; engage lever (74) does not engage in notch in cam set (62).	2. Insufficient clearance between intermediate wheel (64) and motor shaft. Adjust to 1/32 inch with nuts (75), while cam set (62) is in the out-of-cycle position.
Changer plays only inner part of records.	1. Feeler mechanism in pickup head is out of adjustment.	1. Change pickup head (the shell only, not the cartridge).
	2. Feeler mechanism in pickup head is insufficiently retracted.	2. Push pickup head into tone arm until it clicks (catch spring on side must engage).
After a record is played, the pickup continues in the run-out groove.	1. No standard run-out groove on record.	1. Do not use record.
	2. Trip assembly (57) does not operate.	2. Adjust setting of trip assembly (57).
Changer shuts off after each record.	1. Overarm (1) wrongly positioned, or disc spring (129) binding.	1. Place overarm (1) on stack of records, free disc spring (129).
Faulty record drop.	1. Record stack not parallel to turntable, because center hole is damaged.	1. Always use overarm (1), and adjust it to hold record stack horizontal if necessary.

TROUBLE CHART (CON'T.)

Symptom	Cause	Remedy
Changer plays the last record continually, without shutting off.	1. Last record shutoff not working.	1. Make sure that overarm (1) drops below the offset shelf on thin center spindle (14).
After feeler mechanism has retracted over record edge, the tone arm moves across the record toward the center of the record.	1. Needle point is lifted out of groove by accumulated dust.	1. Remove pickup head and clean dust from needle with a soft brush.
	2. Needle broken or chipped.	2. Replace needle if necessary.
Tone arm runs off edge of record without finding run-in groove.	1. Changer not horizontal.	1. Level record changer.
	2. Brake lever (52) misadjusted.	2. Adjust brake lever (52) by means of brake link adjustment nut (55).
	3. Feeler mechanism of pickup head defective.	3. Replace pickup head shell but not the cartridge.
	4. Record has no run-in groove.	4. Do not use record.
Pickup jumps grooves.	1. Insufficient needle pressure.	1. Adjust pickup pressure from eight to nine grams by means of set screw (9A) in front of tone arm base.
Reproduction distorted.	1. Impedance mismatched.	1. Amplifier input of approximately one megohm is required. When changer is playing through a radio, the receiver circuit must be disconnected in the phono position.
	2. Needle is worn or chipped.	2. Replace needle assembly.
	3. Cartridge defective.	3. Replace cartridge.
Hum when record is being played.	1. Pickup lead connected improperly.	1. Reverse pickup leads.
Wow	1. Center hole in record eccentric or too large.	1. Do not use record.
	2. Records are warped and are sliding on each other.	2. Do not use record.
	3. Friction drive slips between motor and turntable.	3. Drive surfaces of drive wheels (93), (94), (95), (96), and (102) must be free from oil and grease. Clean inside rim of turntable.
Excessive surface noise.	1. Needle worn or chipped.	1. Replace needle assembly.
	2. Record is of poor quality or is partly worn.	2. Do not use record.

Ref. No.	Part No.	Description
1	12B-U-140	Overarm, Complete
2	4650/9a	Circlip For Turntable
3	12B-210	Cover Disc For Turntable
4		Tone Arm Mounting Screws
5	15D-U2	Tone Arm, Complete
6	14A-U40	Twin Sapphire Cartridge Assembly DN2
	14A-U50	Wide-range Crystal Cartridge CDS3
	14C-U70	Pick-up Head K
7	3250/13a	Turntable, Complete
8	12A-U108	Lifting Stud, Complete
9	12A-U94	Tone Arm Base With Disc For Base, Complete
10		Changer Mounting Screws
11	12B-184	Cover Plate
12	12B-U2	Main Plate, Complete
13	3268/14	Mat For Turntable
14	12A-U182	Thin Center Spindle, Complete
15	11A-U19	Ball Bearing, Complete
16	11A-U75	Striker Cam, Complete
17	12B-46	Switch Pointer
18	12B-U26	Switch Escutcheon, Complete
19	12B-136	Start Button
20	12B-138	Stop Button
21	12B-140	Repeat Button
22	12B-U80	Push Button Unit
22A	12B-112	Pushrod 1 (2)
22B	12B-114	Pushrod 11
23	12B-U84	Start Lever
24	12B-U86	Stop Lever
25	12B-U88	Repeat Lever
26	12B-130	Bearing Pin For Push-Button Unit
27	12B-110	Guide Plate, Large
28		Locking Lever Spring
29	12B-U100	Locking Lever, Complete
30		Pusher, Complete
31	12B-164	Tension Spring For Pusher
32	12B-U96	Switch Assembly, Complete
33		Switch Lever Actuating Lever
34		Switch Lever Actuating Lever Tension Spring
35	12B-202	Tension Spring For Main Rail
36		Circlip For Start Link
37	12B-U118	Start Link, Complete
38	12A-U207	Main Rail, Complete With Roller
39	12A-U226	Feeler Arm, Complete
40		Feeler Arm Washer
41		Feeler Arm Circlip
42		Lifting Lever Mounting Bracket
43	12A-U127	Clutch Disc, Complete
44	12A-U222	Clutch Plate, Complete
45		Clutch Disc Circlip
46		Compression Spring
47		Circlip
48		Circlip
49	12A-U227	Lifting Lever, Complete
50		Lifting Lever Pin
51	12A-244	Tension Spring For Clutch Plate
52	12A-U228	Brake Lever, Complete
53	12A-U230	Brake Link, Complete
54		Brake Link Compression Spring
55		Brake Link Adjustment Nut
56		End Shutoff Finger Spring
57	12B-U11	Trip Assembly, Complete

Ref. No.	Part No.	Description
58		Muting Switch Spring
59	11A-U21	Gear Wheel Assembly
60	12A-436	Switch Lever
61		Washer
62	12B-U16	Cam Set, Complete
63	12A-196	Intermediate Wheel
64	12A-U214	Drive Wheel, Complete
65		Washer
66		Circlip
67	12A-U217	Distance Rail, Complete
68		Circlip
69		Washer
70	11A-U27	Engage Bracket, Complete
71		Compression Spring
72		Circlip
73		Washer
74	11A-U87	Engage Lever, Complete
75		Engage Lever Adjusting Nuts
76		Compression Spring
77		Washer
78		Cotter Key
79		Circlip
80	12B-U51	Under Plate With Bearing
81		Tone Arm Height Adjustment Screw
82	12A-112	Support Bracket
83		Hex Nuts
84		Circlip
85	12B-198	Repeat Link
86	12B-200	Release Link
87	12A-U221	Rail, Complete
88	12A-U17	Engage Pin Assembly
89	12A-119	Spindle For Dropping Lever
90	12A-U61	Change Bolt, Complete
91	12A-116	Tension Spring For Change Bolt
92	12A-U118	Dropping Lever, Complete
93	12B-U42	Intermediate Wheel 78 RPM Complete
94	12B-U44	Intermediate Wheel 45 RPM Complete
95	12B-U46	Intermediate Wheel 33 RPM Complete
96	12B-U48	Intermediate Wheel 16 RPM Complete
97	12B-U38	Switch Segment Plate, Complete
98		Switch Segment Link
99		Switch Segment Plate Pivot Lever
100		Circlip
101		Washer
102	11A-U48	Drive Wheel, Complete
103		Circlip
104	12B-U54	Swing Lever, Complete
105		Circlip
106	11A-U123	Withdrawal Lever, Complete
107	12B-U32	Motor Plate, Complete
108	31B-Ausf. E	Motor Complete, Without Drive Unit
109	31B-U2	Field Coil I
110	31B-U25	Rotor
111	31B-U14	Lower Bearing, Complete
	630/U1	Upper Bearing Complete
112	31BU3	Field Coil II
113	11A-18	Fixing Bolts For Switch Lever
114	11A-195	Stop Piece
115	12B-U8	Switch Lever, Complete

Ref. No.	Part No.	Description
116	12A-U234	End Shut-off Finger Complete
117	12A-245	Wire Spring
118	12A-325	Lead Cleat
119	12A-414	Spacing Piece
120	12A-427	Bearing For Spacing Piece
121	12B-U12	Over Plate With Muting Switch
122	12B-U24	Switch Link, Complete
123	12B-U28	Switch Lever, Complete
124	12B-U120	Stop Link, Complete
125	12B-146	Guide Plate Small
126	31B-59	Motor Pulley For 60 cps
	31B-52	Motor Pulley For 50 cps
	31B-69	Motor Pulley For 40 cps

Ref. No.	Part No.	Description
127	11A-95	Tension Spring For Engage Lever
128	12A-189	Support Springs For Tone Arm
129	12A-300	Disc Spring For Overarm
130	12A-452	Tension Spring For Feeler Arm
131	12B-135	Tension Spring For Push Rods
132	12B-208	7" 45 RPM Adapter
133	11A-221	Short Spindle
134	13A-Ausf. B2	Large Center Spindle 45 RPM AS3
135		Tension Spring For Drive Wheel
136	11A-U40	Voltage Selector Switch, Complete

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

EXCEL MODEL XL-45

EXCEL MODEL
XL-45

EXCEL MODEL
XL-45

TRADE NAME	Excel Model XL-45
IMPORTER	Excel Corp. of America, 9 Rockefeller Plaza, New York 20, N. Y.
TYPE SET	Battery Operated 4 Tube Portable AM Receiver

POWER SUPPLY 1.5 Volts DC "A" Supply & 67.5 Volts DC "B" Supply
RATING 115MA@1.5 Volts DC & 11.3MA@67.5 Volts DC
TUNING RANGE—BROADCAST 535KC — 1605KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A4, A6..... GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003
WALSCO #2516, 2519
A5, A7..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna lug of tuning gang. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1605KC	"	"	A5	"
3.		Loop	600KC	"	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1400KC	"	"	A7	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

J137

SET 453 FOLDER 7

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1U6	
V2	IF Amplifier	1AM4/ 1T4-SF	
V3	Det. -AVC-AF Amp.	1AS5/ 1U5-SF	
V4	Output	3Z4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	EXCEL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	7	150	①	SRE150V10	NLW10-150	TC41	TD-10-150	TE-1507	

① Some versions may use 10mfd in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	EXCEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	50				SI 50	D6-500	L10Q5	UC-545	5GA-Q5	
C3	.01	250			P485N-01	DD-103	STM4S1	GTM411	4EP-S10	
C4	.05	250			P485N-05	DF-503	STM4S5	GTM415	4EP-S50	
C5	.002	200			P285N-002	DD-202	STM4D22	GTM222	65P20253	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EXCEL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1meg	½						Volume & Switch

RESISTORS

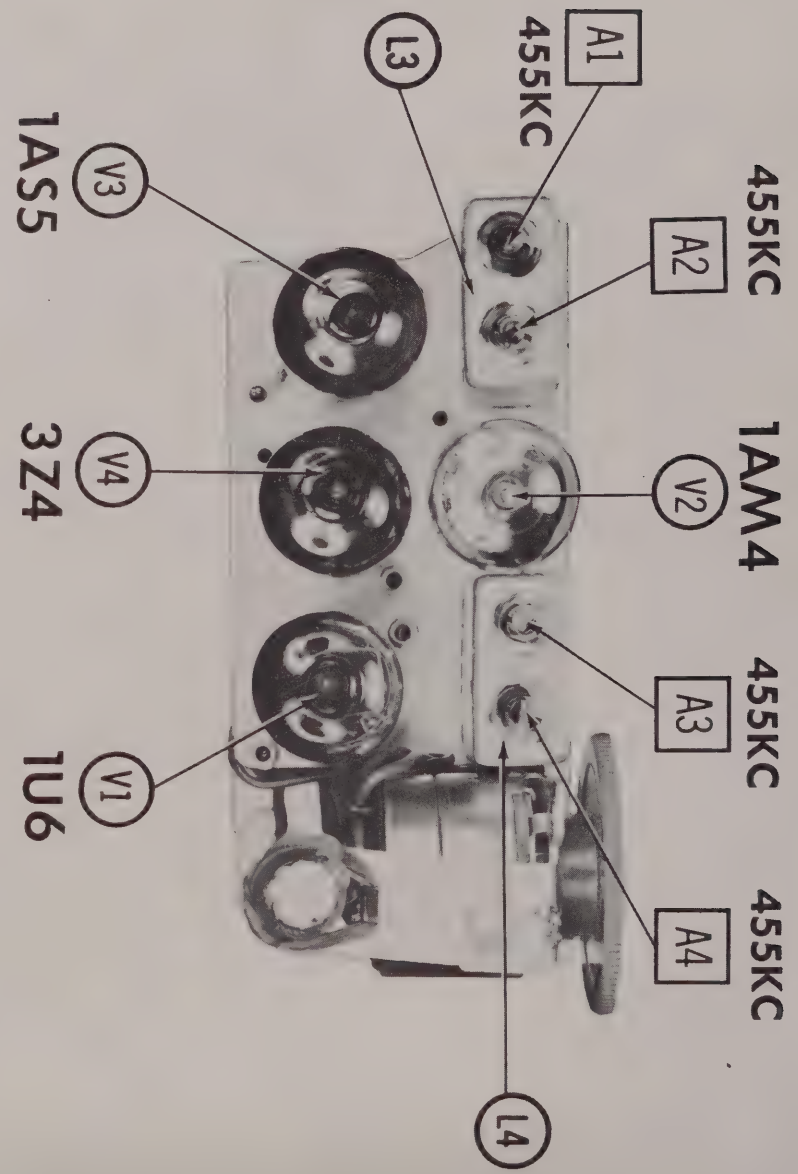
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		EXCEL PART No.	NOTES
	OHMS	WATT		
R2	200K			
R3	33K			
R4	3.3meg			
R5	560Ω			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	EXCEL PART No.	REPLACEMENT DATA
K1	Audio Couplate	150mmf, 150mmf, 1000mmf, 2000mmf, 10000mmf, 1meg, 3.3meg, 4.7meg, 10meg	KCR-1163	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		EXCEL PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1 L2 L3 L4	Loopstick Osc. Coil Input IF Output IF		14-1074	14-1074				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	EXCEL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	8000Ω	13Ω								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	EXCEL PART No.	QUAM PART No.	
SP1	2½"	PM	12-13Ω		25A07Z13	

BATTERIES

ITEM No.	VOLTAGE	EXCEL PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1 M2	67.5V 1.5V		2	XX45	950	467	M13M	M200	

MISCELLANEOUS

ITEM No.	PART NAME	EXCEL PART No.	NOTES
M3	Tuning Cap		2 Gang (Ant. 11—255mmf, Osc. 13—120mmf)

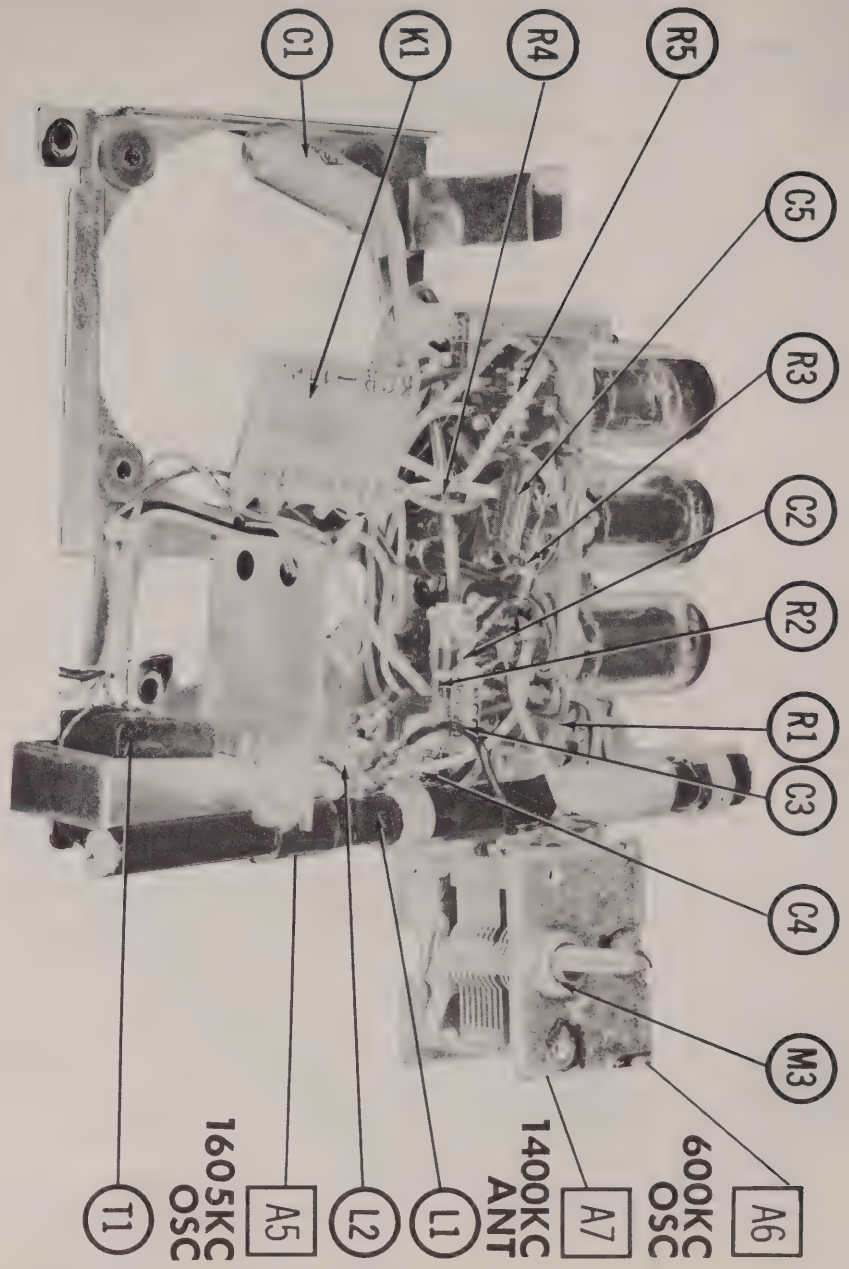
CABINETS & CABINET PARTS

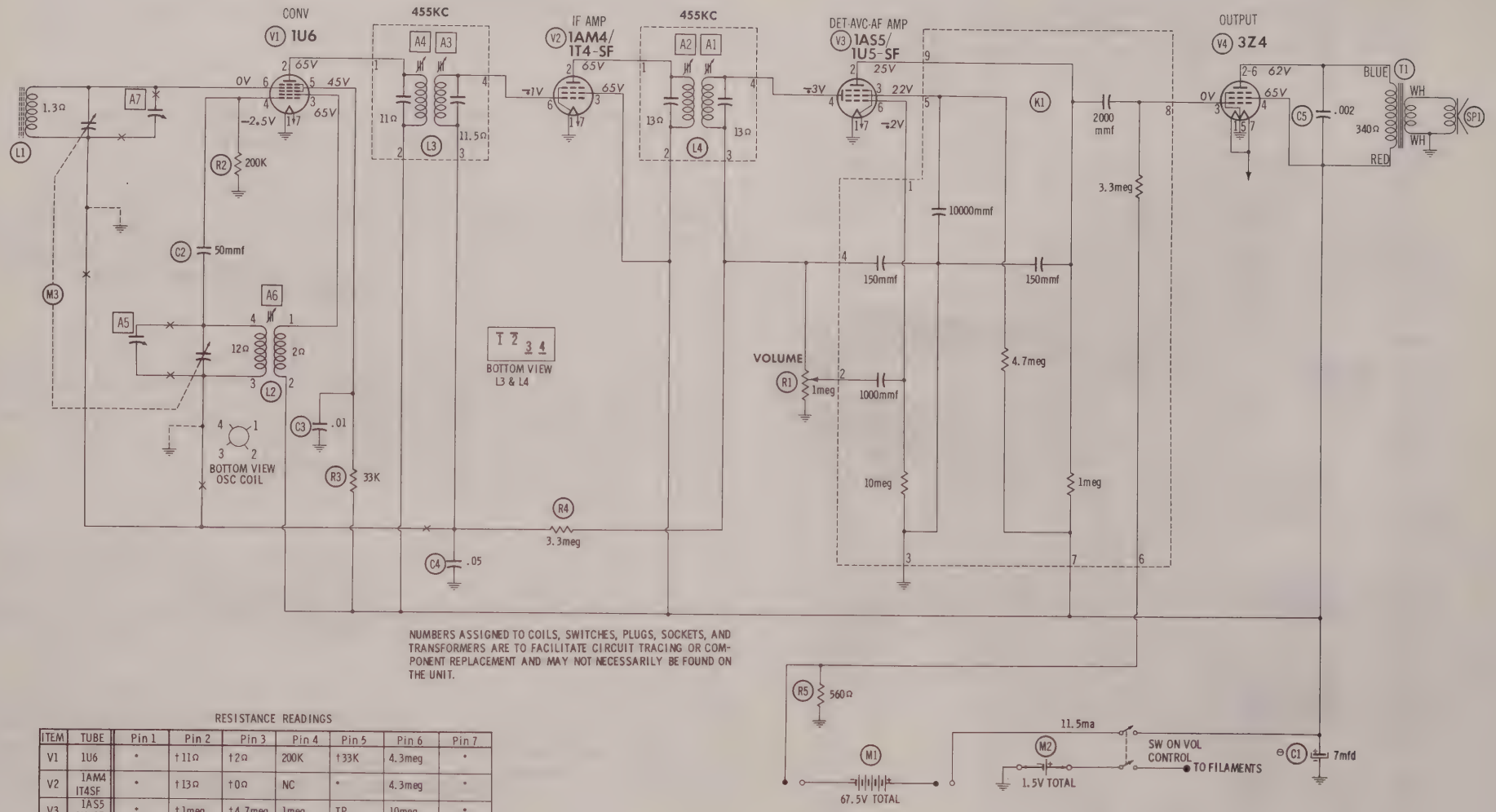
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS BOTTOM VIEW





NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1U6	*	†11Ω	†2Ω	200K	†33K	4.3meg	*
V2	1AM4 IT4SF	*	†13Ω	†0Ω	NC	*	4.3meg	*
V3	1AS5 1U5SF	*	†1meg	†4.7meg	1meg	TP	10meg	*
V4	3Z4	*	†340Ω	3.3meg	†0Ω	*	†340Ω	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM POSITIVE TERMINAL OF C1.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1959

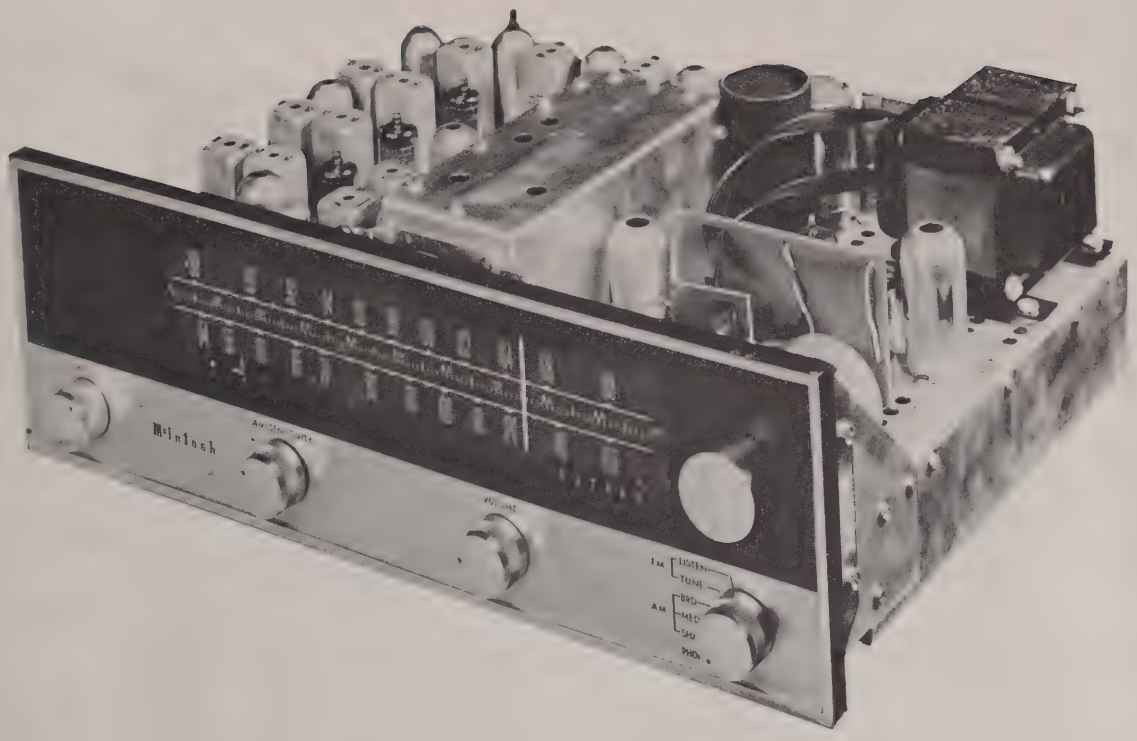
EXCEL MODEL XL-45

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MC INTOSH
MODEL MR-55

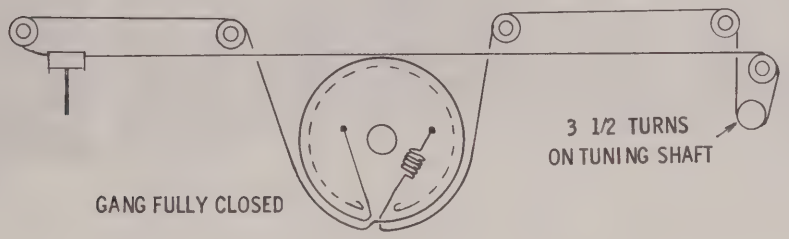
MC INTOSH
MODEL MR-55



MC INTOSH
MODEL MR-55

TRADE NAME	McIntosh Model MR-55		
MANUFACTURER	McIntosh Laboratory, Inc., 2 Chambers St., Binghamton, N. Y.		
TYPE SET	AC Operated 18 Tube FM-AM Tuner		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	69 Watts, .65 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 540 - 1620KC	FREQ. MOD.	88 - 108MC

DIAL CORD STRINGING



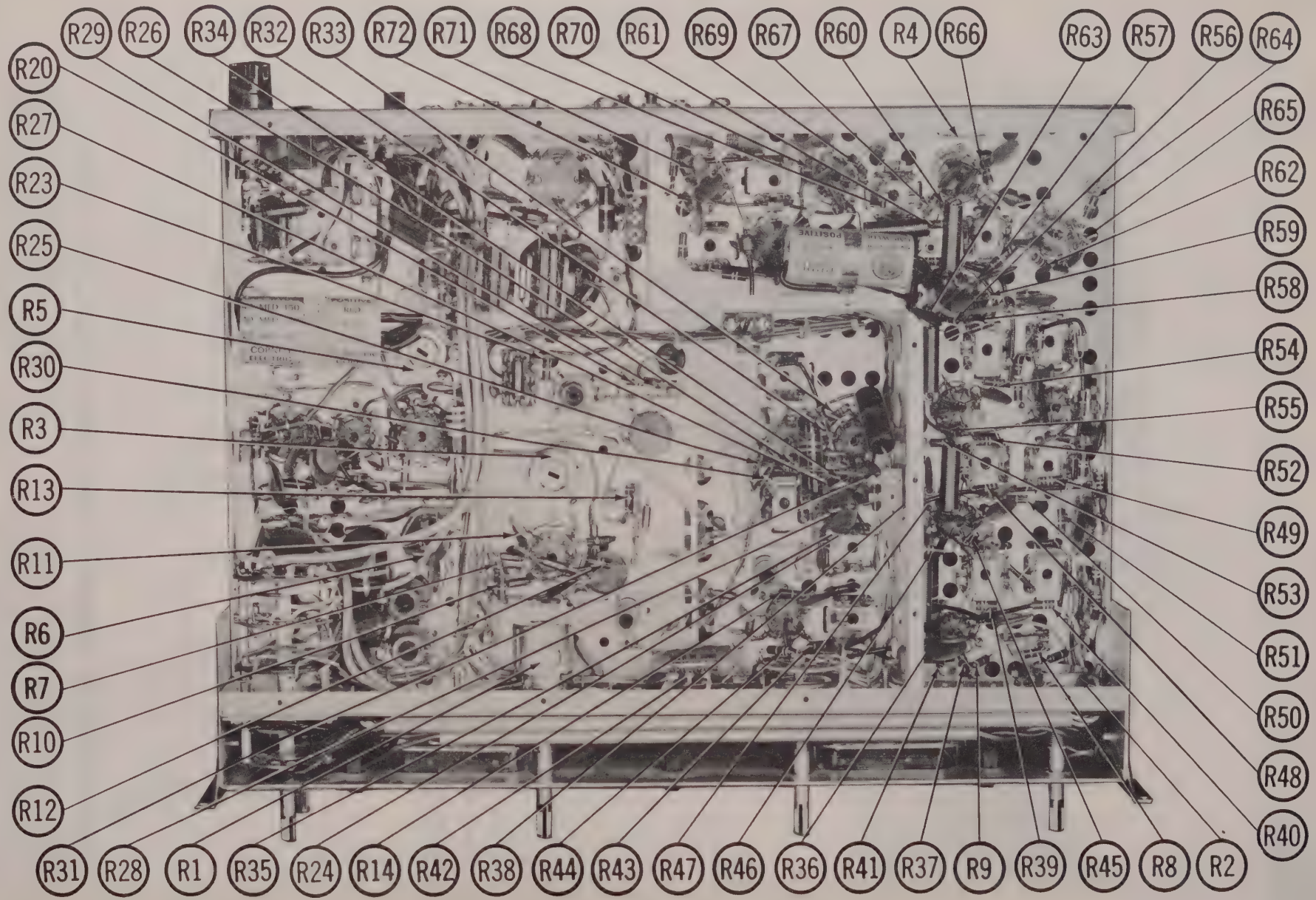
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

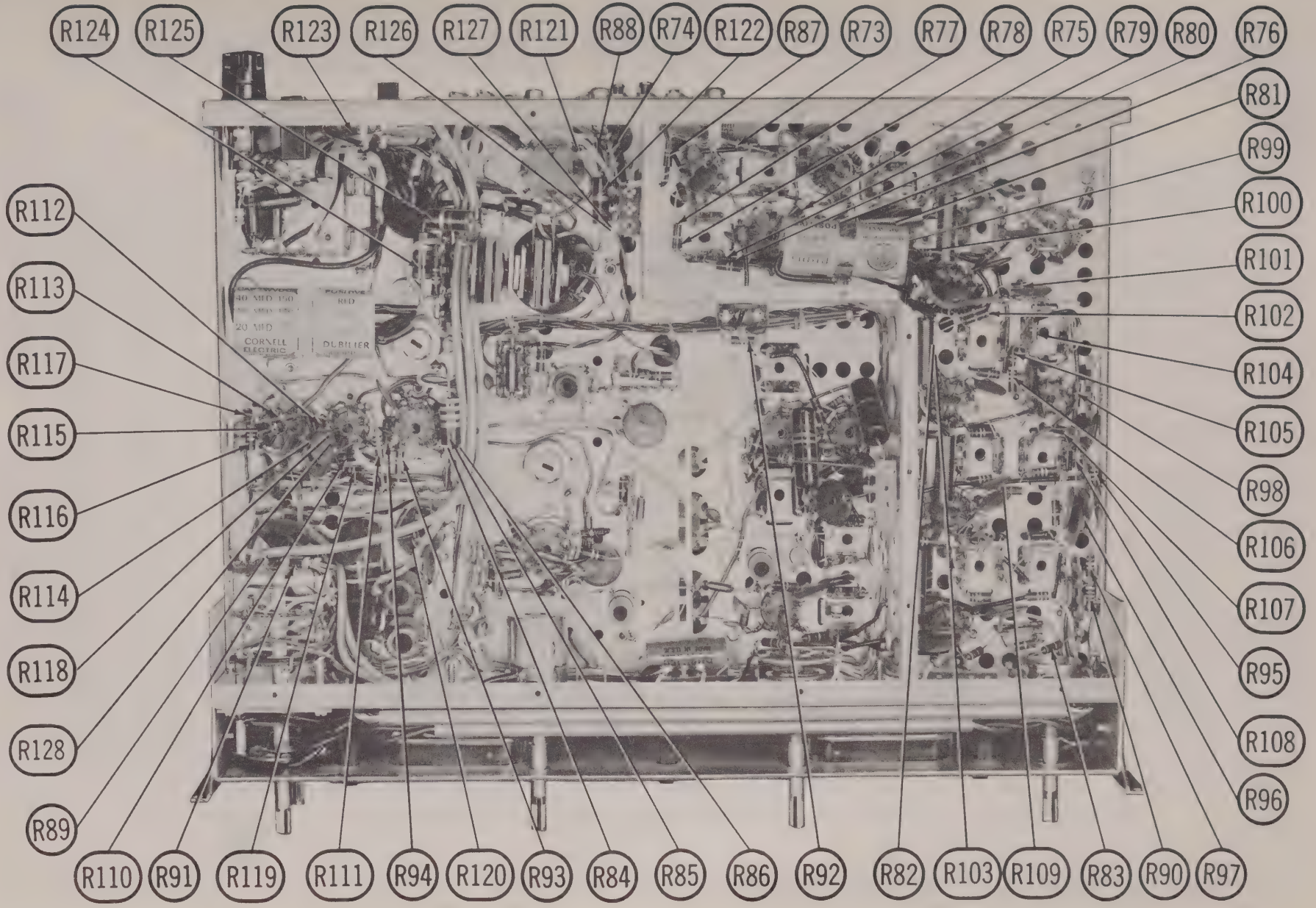
H938

DATE 8-59 SET 453 FOLDER 8

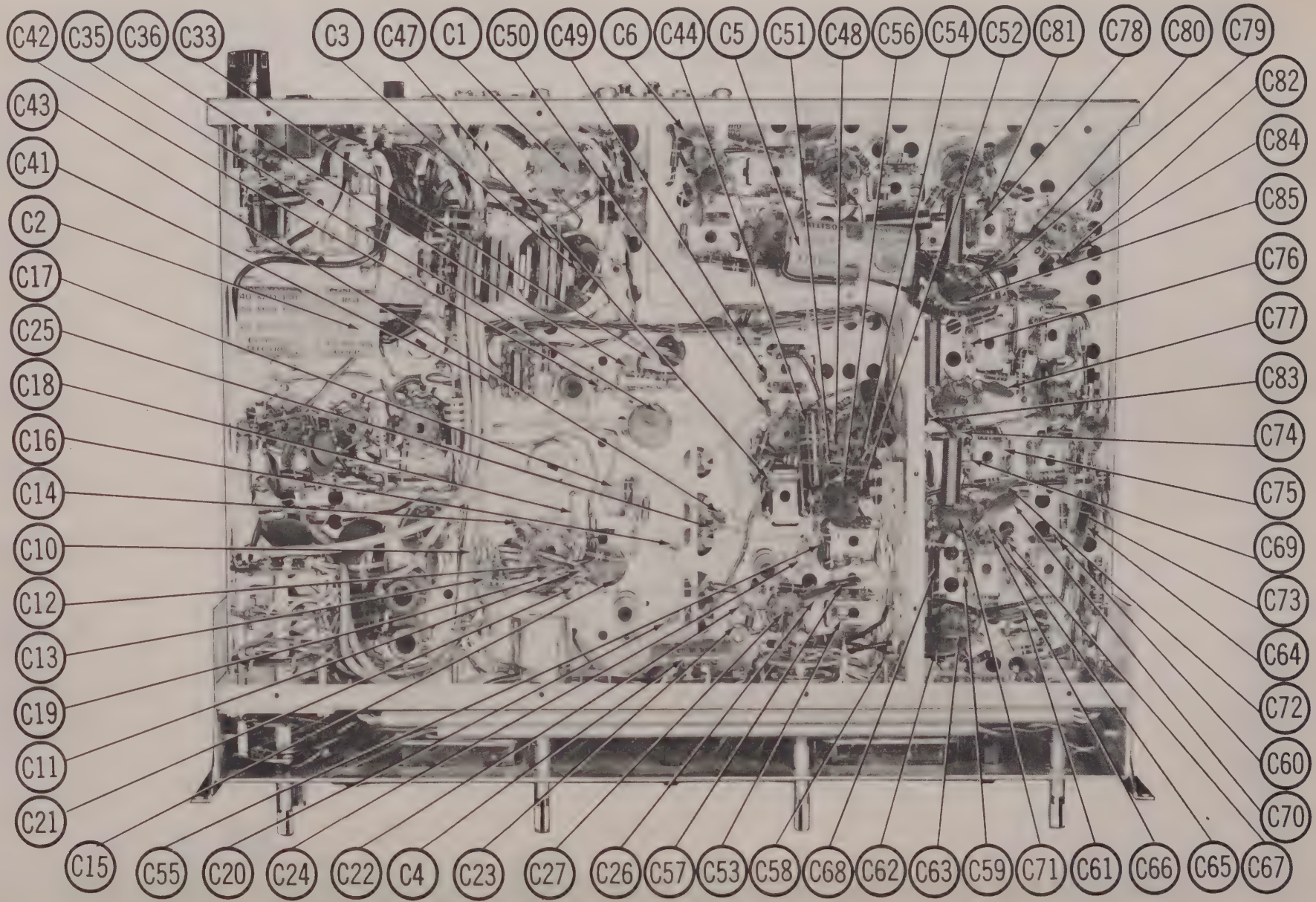
SET 453 FOLDER 8



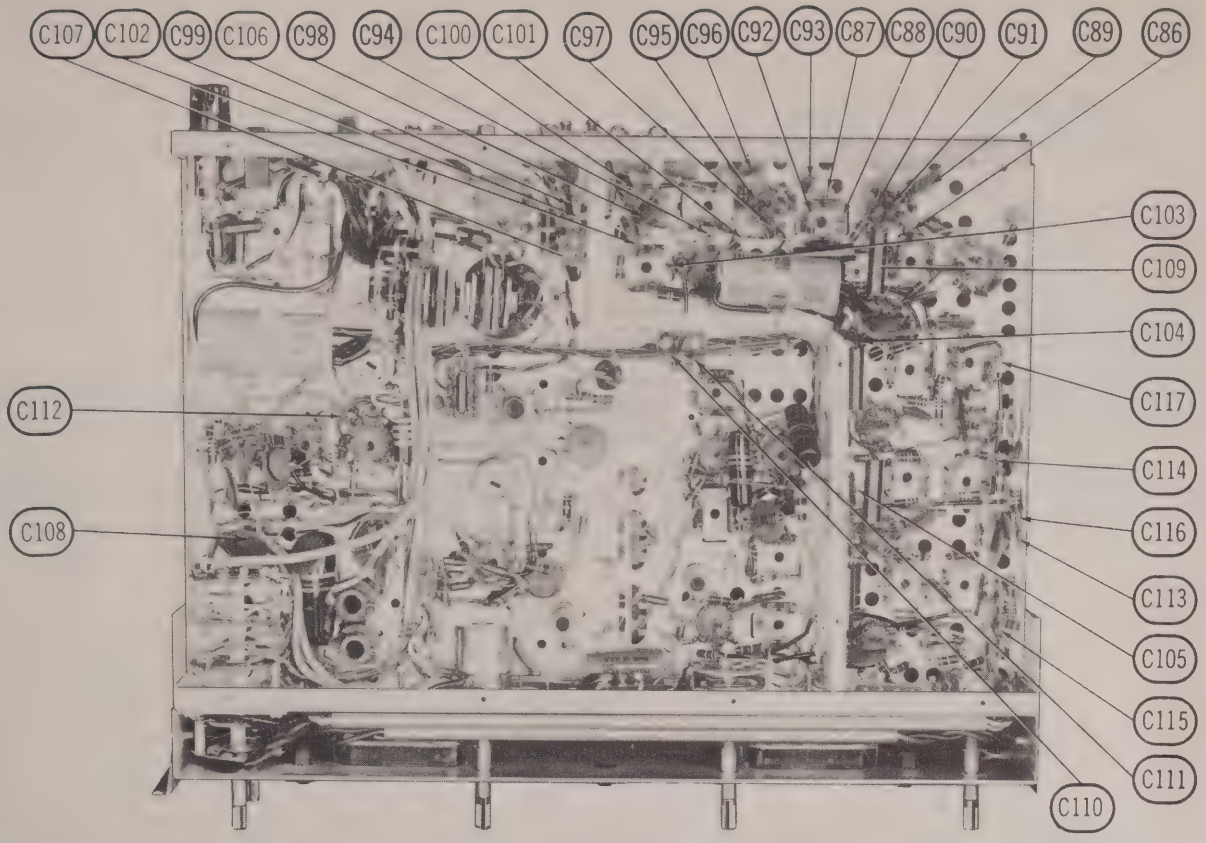
CHASSIS BOTTOM VIEW – RESISTOR IDENT. (R1 -R72)



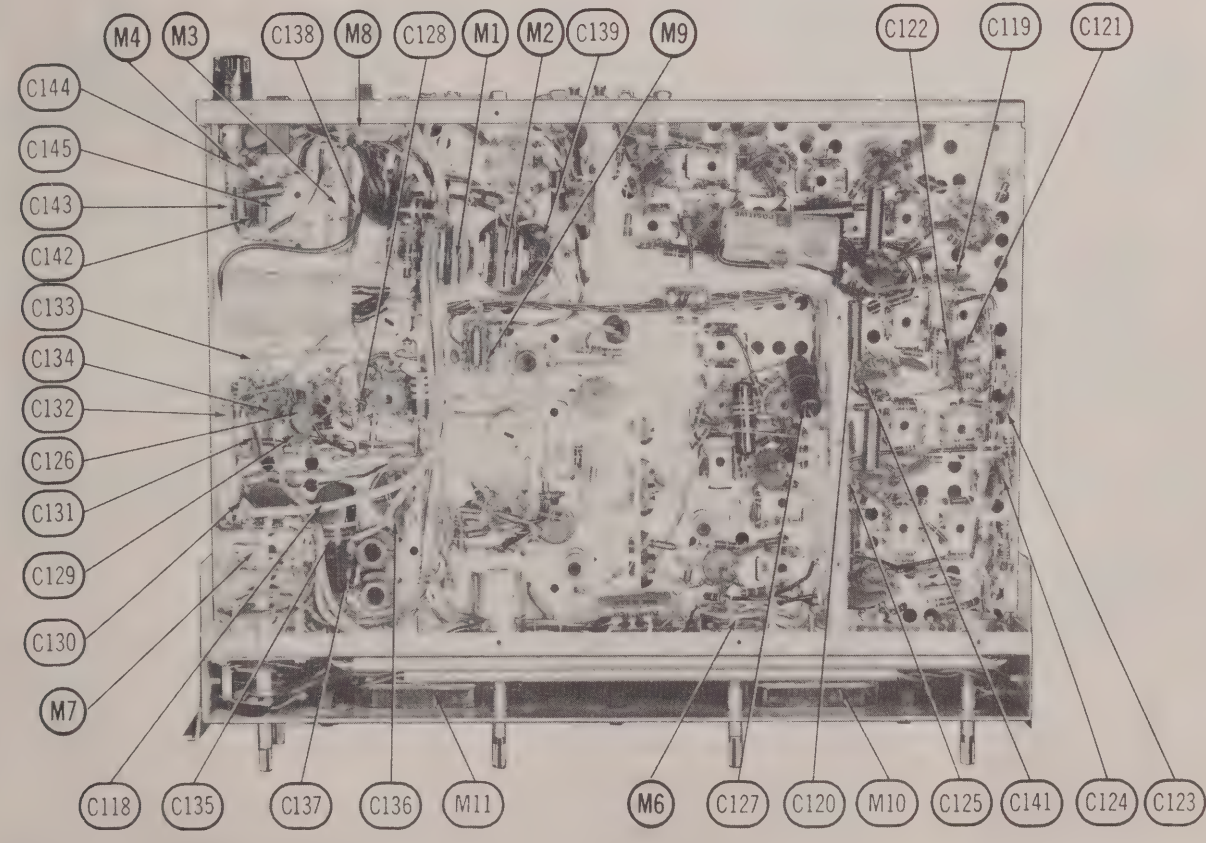
CHASSIS BOTTOM VIEW – RESISTOR IDENT. (R73-R128)



CHASSIS BOTTOM VIEW — CAPACITOR IDENT. (C1-C85)



CHASSIS BOTTOM VIEW – CAPACITOR IDENT. (C86-C117)



CHASSIS BOTTOM VIEW – MISC. & CAPACITOR IDENT. (C118-C145)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp.	6BZ7	
V2	FM Mixer	6AB4	
V3	FM AFC-FM Osc.	6BZ7	
V4	AM RF Amp.	6BA6	
V5	AM Converter	6BE6	
V6	1st FM-AM IF Amp.	6BJ6	
V7	2nd FM-AM IF Amp.	6AU6	
V8	3rd FM IF Amp.	6BJ6	
V9	4th FM IF Amp.	6AU6	
V10	FM AVC	6AL5	

ITEM No.	USE	TYPE	NOTES
V11	1st FM Limiter	6BN6	
V12	2nd FM Limiter	6AU6	
V13	Ratio Detector	6AL5	
V14	FM AFC Detector	6BV8	
V15	FM Meter Amp. - Squelch Amp.	12AU7	
V16	AM Det. -AVC	6AL5	
V17	AM AVC Clamper- Squelch Rect.	6AL5	
V18	AF Amp. -Cath. Follower	12AU7	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MC INTOSH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▪40	150		AFH4-01	D0010	FP327.89	TMQ-1	TVL-4441	
B	▲40	150	①			TC47			
C	30	150	①						
D	▪40	150							
C2A	40	150		PRS150V40 4020	BBRT44215	TCT3116	TDLT-4	TVA-3448	
B	40	150							
C	20	150							
C3	2000	15			A0070	WP041	TMS-5	TVL-1168	
C4	5	50		PRS50V5	BBR5-50	TC30	TD-5-50	TVA-1303	
C5A	20	150		PRS150V2020	BBRD2215	TCD45	TDLD-3	TVA-2428	
B	20	150							
C6	25	25		PRS25V25	BBR25-25	TC26	TD-25-25	TVA-1205	

① In some versions C1C is not used and C1B is 70mfd.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA MC INTOSH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C7	3.3		10%		NPO-SI 3.3	TCZ-3R3	CTA6V33C	CNO-533	5TCCB-V33S 10%*	
C8	220				BPD-0002	DD-221	L10T22	B-322	5GA-T22	
C9	3.3		10%		NPO-SI 3.3	TCZ-3R3	CTA6V33C	CNO-533	5TCCB-V33S 10%*	
C10	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C11	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C12	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C13	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C14	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C15	2000				BPD-02	DD-203	BYB6S2	B-120	5GA-S2	
C16	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C17	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C18	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C19	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C20	10		5%		NPO-DI 10	DTZ-10		CNO-410	5TCC-Q1S 5%*	①
C21										
C22	4.7		NPO 5%		NPO-DI 4.7	DTZ-4R7	C10V47C	CNO-547	5TCCB-V47S 5% *	②
C23	10		NPO 5%		NPO-DI 10	DTZ-10	C10Q1C	CNO-410	5TCC-Q1S 5% *	
C24										
C25	1.5		10%		NPO-SI 1.5	DTZ-1R5	C10V15C	CNO-515	5TCCB-V15S 10%*	
C26	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C27	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C28	47				BPD-00047	DD-470	L10Q47	CNO-447	5GA-Q47	
C29	6.8		N470 ± .25mmf							③
C30										
C31	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C32	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA MC INTOSH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C33	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C34	.33	100			P288N-33			GEM-2033	2TM-P33S *	
C35	20000				BPD-02	DD-203	BYB6S2	B-120	5GA-S2	
C36	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C37	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C38	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C39	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C40	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C41	47				BPD-000047	DD-470	L10Q47	CNO-447	5GA-Q47	
C42	1.8		10%						5TCCB-V18S 10%*	④
C43	12		NPO 5%		NPO-DI 12	DTZ-12	C10Q12C	CNO-412	5TCC-Q12S 5% *	
C44	.018	200	5%						5BF-SI8	
C45										
C46	10		5%		NPO-DI 10	DTZ-10	C10Q1C	CNO-410	5TCC-Q1S 5% *	
C47	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C48	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C49	47				BPD-00047	DD-470	L10Q47	B-347	5GA-T47	
C50	15		5%		NPO-DI 15	DTZ-15	C10Q15C	CNO-415	5TCC-Q15S 5% *	
C51	20000				BPD-02	DD-203	BYB6S2	B-120	5GA-S2	
C52	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C53	2.2		10%		NPO-SI 2.2	TCZ-2R2	CTA6V22C	CNO-522	5TCCB-V22S 10%*	
C54	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C55	470		5%		BPD-00047		5R5T47		5GA-T47S 5% *	
C56	20000				BPD-02	DD-203	BYA6S2	B-120	5GA-S2	
C57	470		5%		1464-00047		5R5T47		MS-347	
C58	22		N330 5%			TCA-22				
C59	1.0		10%		NPO-SI 1.0	TCZ-1		CNO-510	5TCCB-V1S 10%*	
C60	470				1464-00047		5R5T47		MS-347	
C61	20000				BPD-02	DD-203	BYB6S2	B-120	5GA-S2	
C62	20000				BPD-02	DD-203	BYA6S2	B-120	5GA-S2	
C63	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C64	20000				BPD-02	DD-203	BYA6S2	B-120	5GA-S2	
C65	4.7		N470 5%							
C66	22		N330 5%			TCA-22				
C67	470 5%				1464-00047		5R5T47		MS-347	
C68	.047	200			P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C69	1.2		10%						5TCCB-V12S 10%*	
C70	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C71	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C72	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C73	20000				BPD-02	DD-203	BYA6S2	B-120	5GA-S2	
C74	47		10%		NPO-SI 4.7	TCZ-4R7	CTA6Q47C	CNO-547	5TCC-Q47 S 10%*	
C75	.47		10%							
C76	1.2		10%						5TCCB-V12S 10%*	
C77	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C78	.47		10%							
C79	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C80	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C81	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C82	47				BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C83	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C84	47				BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C85	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C86	4.7		10%		NPO-SI 4.7	TCZ-4R7	CTA6V47C	CNO-547	5TCCB-V47 10% *	
C87	2		10%				C10V2C		5TCCB-V2S 10% *	
C88	1.0		10%		NPO-SI 1.0	TCZ-1		CNO-510	5TCCB-V1S 10% *	
C89	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C90	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C91	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C92	1.0		10%		NPO-SI 1.0	TCZ-1		CNO-510	5TCCB-V1 S 10% *	⑤
C93	22		N330 5%			TCA-22				
C94	6.8		10%		NPO-SI 6.8	TCZ-6R8	CTA6V68C	CNO-568	5TCCB-V68S 10%*	
C95	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C96	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C97	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C98	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C99	1000				EF-001	MFT-1000			503C-D1	
C100	470				BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C101	4.7		10%		NPO-SI 4.7	TCZ-4R7	CTAV47C	CNO-547	5TCCB-V47S 10%*	
C102	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C103	47				BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C104	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MC INTOSH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C105	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C106	470				BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C107	20000				BPD-02	DD-203	BYB6S2	B-120	5GA-S2	
C108	20000				BPD-02	DD-203	BYB6S2	B-120	5GA-S2	
C109	20000				BPD-02	DD-203	BYB6S2	B-120	5GA-S2	
C110	100				BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C111	470				BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C112	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C113	12		NPO 5%		NPO-DI 12	DTZ-12	C10Q12C	CNO-412	5TCC-Q12S 5% *	⑥
C114	10		NPO 5%		NPO-DI 10	DTZ-10	C10Q1C	CNO-410	5TCC-Q1S 5% *	
C115	22		N330 5%			TCA-22				
C116	22		N330 5%			TCA-22				
C117	3.9		10%						5TCCB-V39S 10%*	
C118	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C119	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C120	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C121	47				BPD-000047	DD-470	L10Q47	CNO-447	5GA-Q47	
C122	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C123	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C124	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C125	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C126	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C127	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C128	47				BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	⑦
C129	20000				BPD-02	DD-203	BYB6S2	B-120	5GA-S2	
C130	20000				BPD-02	DD-203	BYB6S2	B-120	5GA-S2	
C131	20000				BPD-02	DD-203	BYB6S2	B-120	5GA-S2	
C132	330		10%		DI 330	D6-331	L10T33	JL-333	5GA-T33S 10% *	
C133	2.2		10%		NPO-SI 2.2	DTZ-2R2	CTA6V22C	CNO-522	5TCCB-V22S 10%*	
C134	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C135	.47	200			P288N-47		CUB2P47	GEM-2047	2TM-P47	⑧
C136	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C137	4700		10%		1464-0047		1R5D47		MS-247	
C138	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C139	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C140	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C141	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C142A	10000				BPD-2X01	DD3-103	BYD6DS1	B-110	5HK-S1	
B	10000							B-110	5HK-S1	
C143	1.5		10%		NPO-SI 1.5	TCZ-1R5	CTA6V15C	CNO-512	5TCCB-V15S 10%*	
C144	1.5		10%		NPO-SI 1.5	TCZ-1R5	CTA6V15C	CNO-512	5TCCB-V15S 10%*	
C145	1.5		10%		NPO-SI 1.5	TCZ-1R5	CTA6V15C	CNO-512	5TCCB-V15S 10%*	

① Some versions may use 12mmf in this application.
② Not used in some versions.
③ Some versions may use 4.3mmf N470 ± .25mmf in this application.
④ Some versions may use 2.2mmf 10% in this application.
⑤ Some versions may use 3.3mmf 10% in this application.
⑥ Some versions may use 10mmf 5% in this application.
⑦ Some versions may use 470mmf in this application.
⑧ Some versions may use .22mfd 200V in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MC INTOSH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	DX5956	B-70	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	
D	Sw.Cover			KB-5				
R2A	1meg	½	DX5957	B-69	A47-1meg-S	Q11-137	U54	FM-AFC, Note 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3	1000Ω	2(WW)		WN-102 ■	39-1000	WPSl000 ■	FL-1K	FM Sensitivity
R4	1000Ω	2(WW)		WN-102	39-1000	WPSl000	FL-15K	Limiter Adjustment
R5	3000Ω	2(WW)		WN-302 ■	39-3000	WPS3000■	C3MP ■	FM Meter Balance
R6	5000Ω	2(WW)		WN-502 ■	39-5000	WPS5000 ■	C5MP ■	Whistle Filter

■ Enlarge mounting hole.

Note 1. Some versions may use 500K in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MC INTOSH PART No.	NOTES
	OHMS	WATT		
R7	220Ω			
R8	3.3meg			
R9	4.7meg			
R10	100Ω			
R11	68Ω			
R12	10K			
R13	1000Ω			
R14	1000Ω			Note 1
R15	6800Ω			
R16	22Ω			
R17	4700Ω			
R18	220Ω			
R19	330K			
R20	1meg			Note 2
R21	6800Ω			
R22	220Ω			
R23	10Ω			
R24	10K			
R25	10Ω			
R26	470K			
R27	4700Ω			
R28	470Ω			
R29	100Ω			
R30	10Ω			
R31	220K			
R32	10Ω			
R33	22K			
R34	1000Ω			
R35	470Ω			
R36	22K			
R37	470K			
R38	2.2meg			
R39	47K			Note 3
R40	470Ω			
R41	68Ω			
R42	47Ω			
R43	1000Ω			
R44	3300Ω			
R45	220Ω			
R46	470K			
R47	100K			
R48	33K			
R49	180K			
R50	470Ω			
R51	220Ω			
R52	68K			
R53	220K			
R54	470Ω			
R55	100Ω			
R56	47K			
R57	470Ω			
R58	2200Ω 5%			
R59	100Ω			
R60	47K			
R61	220K			
R62	470K			
R63	100K			
R64	1meg			
R65	470K			
R66	10K			
R67	470Ω			

Note 1. Some versions may use 3300Ω in this application.
Note 2. Some versions may use 330K in this application.
Note 3. Some versions may use 4700Ω in this application.
Note 4. Some versions may use 47K in this application.

ITEM No.	RATING		MC INTOSH PART No.	NOTES
	OHMS	WATT		
R68	15K			
R69	22K			
R70	220Ω			
R71	1800Ω			
R72	1800Ω			
R73	68Ω			
R74	68Ω			
R75	470K			
R76	220Ω			
R77	1000Ω			
R78	100Ω			
R79	100K			Note 4
R80	100K			Note 4
R81	220K			Note 5
R82	10K			
R83	1meg			Note 6
R84	10K			
R85	33K			
R86	2200Ω 5%			
R87	150K 5%			
R88	2.2meg			
R89	2.2meg			
R90	47K			Note 7
R91	2.2meg			
R92	220K			
R93	100K			
R94	1500Ω			
R95	330K			
R96	180K			
R97	100K			
R98	220Ω			
R99	100Ω			
R100	330Ω			
R101	68Ω			
R102	68Ω			
R103	68Ω			
R104	18K			
R105	27K			
R106	470K			
R107	1meg			
R108	100K			
R109	100K			
R110	2.2meg			
R111	33K			
R112	2.2meg			
R113	1.5meg			
R114	1meg			
R115	560K			
R116	33K			
R117	1meg			
R118	4700Ω			
R119	100K			
R120	18K			
R121	100K			
R122	68Ω	2		
R123	2.2Ω	5		
R124	100Ω	2		
R125	100Ω	2		
R126	330Ω			
R127	330Ω			
R128	4700Ω			

Note 5. Some versions may use 100K in this application.
Note 6. Some versions may use 330K in this applicaton.
Note 7. Some versions may use 33K in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MC INTOSH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil							
L2	FM Ant. Coil							5 Turns on 6.8mmf
L3	RF Choke							.18uh
L4	RF Choke							.278uh
L5	RF Choke							1.2uh
L6	RF Choke							1.8uh
L7	RF Choke							.47uh
L8	Fil. Choke							1.2uh
L9	Cathode Choke							1.2uh
L10	RF Choke							2 Turns on 47Ω
L11	RF Choke							1.2uh
L12	RF Choke							1.2uh ①
L13	FM RF Coil							
L14	FM Mixer Coil							
L15	Cathode Choke							1.2uh
L16	RF Choke							6 Turns on 150Ω
L17	RF Choke							1.2uh
L18	FM Osc. Coil							
L19	AM Ant. Trans.		14-1075 *	14-1075 *				
L20	RF Choke				SW-631			4.7uh
L21	AM RF Trans.							
L22	AM Osc. Coil							
L23	RF Choke							1.2uh ①
L24	Fil. Choke							1.2uh
L25	1st FM IF Trans.	1607-5	16-3487	16-3487	FM-254	1463		
L26	1st AM IF Trans.	B1-987						
L27	2nd FM IF Trans.	1607-5	16-3487	16-3487	FM-254	1463		
L28	2nd AM IF Trans.							
L29	Fil. Choke							2uh
L30	Fil. Choke							2uh
L31	3rd FM IF Trans.	1607-5	16-3487	16-3487	FM-254	1463		
L32	3rd AM IF Trans.	1655-8	16-6758	16-6758	BC-353	12-C2	RF-2	
L33	4th FM IF Trans.	1607-5	16-3487	16-3487	FM-254	1463		
L34	4th AM IF Trans.	1655-8	16-6758	16-6758	BC-353	12-C2	RF-2	
L35	Fil. Choke							2uh
L36	5th FM IF Trans.	1607-5	16-3487	16-3487	FM-254	1463		
L37	Fil. Choke							2uh
L38	RF Choke		19-1015	19-1015	TV-186	4631	VP-2	75uh
L39	Fil. Choke							2uh
L40	Limiter Trans.		16-3487	16-3487	FM-254	1463		
L41	Ratio Detector		17-3498	17-3498				
L42	AFC Det. Trans.		17-3494	17-3494				
L43	Fil. Choke							
L44	RF Choke		19-1015	19-1015	TV-186	4631	VP-2	75uh
L45	RF Choke		19-1047	19-1047	BC-549	4666		2.5uh
L46	10KC Filter							
L47	10KC Filter							
L48	Line Choke							2uh
L49	Line Choke							2uh
L50	Line Choke							2uh

* Drill new mounting hole.

① Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	MC INTOSH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .65A	240VCT ⓐ .095A	12V ⓐ .38A	M-188						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ⓐ 5.3A									

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	MC INTOSH PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.094A	①	1234AH ① HA154 ②	TO65 ① SD-94 ②	65 ① *K200 ②		① Selenium type. ② Silicon type. * Add 10Ω series resistor
M2	.094A		1234AH ① HA154 ②	TO65 ① SD-94 ②	65 ① *K200 ②		
M3	.380A	②	HF501 ②	SD-91 ②	Model 101 ① 10M ②		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MC INTOSH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4	3AG	2A 250V	①		312002. (3AG 2A 250V)	342012	AGC 2	HKP-CC

① Some versions may use 1A Slo-Blo in this application.

MISCELLANEOUS

ITEM No.	PART NAME	MC INTOSH PART No.	NOTES
M5	Tuning Cap.		6 Gang (AM Sections: Ant. 10-508mmf, RF Sections: 7-495mmf, Osc. 4-156mmf)
M6	Switch		AM Sensitivity (Rotary Wafer Type)
M7	Switch		FM-AM Selector (Rotary Wafer Type)
M8	Switch		Lamps-Hi-Lo (SPST, Slide Type)
M9	Switch		Antenna, AM Ant.-Loop (DPDT, Slide Type)
M10	Meter		FM Tuning
M11	Meter		Sensitivity

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS — TOP VIEW

MC INTOSH
MODEL MR-55

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ7	†1200Ω	680K	500Ω	0Ω	.1Ω	†300Ω	670K	68Ω	0Ω
V2	6AB4	†23K	0Ω	.1Ω	0Ω	NC	.1Ω	1000Ω		
V3	6BZ7	†5700Ω	7000Ω	220Ω	0Ω	.1Ω	†7800Ω	3meg	220Ω	0Ω
V4	6BA6	▲3.5meg	0Ω	.1Ω	0Ω	▲†6000Ω	▲†1300Ω	▲4300Ω		
V5	6BE6	▲22K	▲.4Ω	.1Ω	0Ω	▲†1300Ω	▲†2300Ω	▲3.2meg		
V6	6BJ6	2.5meg	4300Ω	.1Ω	0Ω	†840Ω	†1300Ω	0Ω		
V7	6AU6	1.3meg	0Ω	.1Ω	0Ω	†625Ω	†1100Ω	220Ω		
V8	6BJ6	800K	100Ω	.1Ω	0Ω	†400Ω	†800Ω	0Ω		
V9	6AU6	.7Ω	0Ω	.1Ω	0Ω	†2900Ω	†2400Ω	100Ω		
V10	6AL5	4Ω	470K	.1Ω	0Ω	47K	0Ω	470K		
V11	6BN6	400Ω	4Ω	0Ω	.1Ω	†1300Ω	400Ω	†770Ω		
V12	6AU6	22K	0Ω	0Ω	.1Ω	†1000Ω	†1200Ω	0Ω		
V13	6AL5	INF	INF	.1Ω	0Ω	1800Ω	0Ω	1800Ω		
V14	6BV8	100Ω	470K	†1000Ω	.1Ω	0Ω	100K	200K	0Ω	100K
V15	12AU7	†105K	0Ω	1500Ω	.1Ω	.1Ω	†10K	320K	1100Ω	0Ω
V16	6AL5	0Ω	500K	.1Ω	0Ω	27K	0Ω	735K		
V17	6AL5	1.6meg	2.2meg	0Ω	.1Ω	33K	0Ω	2.2meg		
V18	12AU7	†360K	3.7meg	33K	.1Ω	.1Ω	†5500Ω	1.1meg	100K	0Ω
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

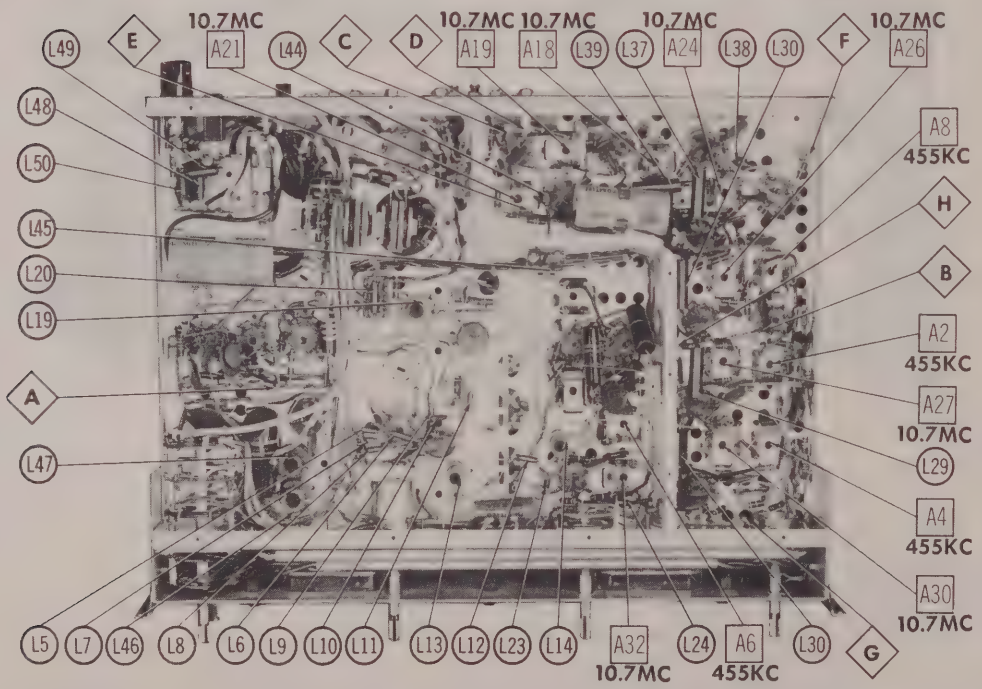
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.

▲ MEASURED IN "AM" POSITION.

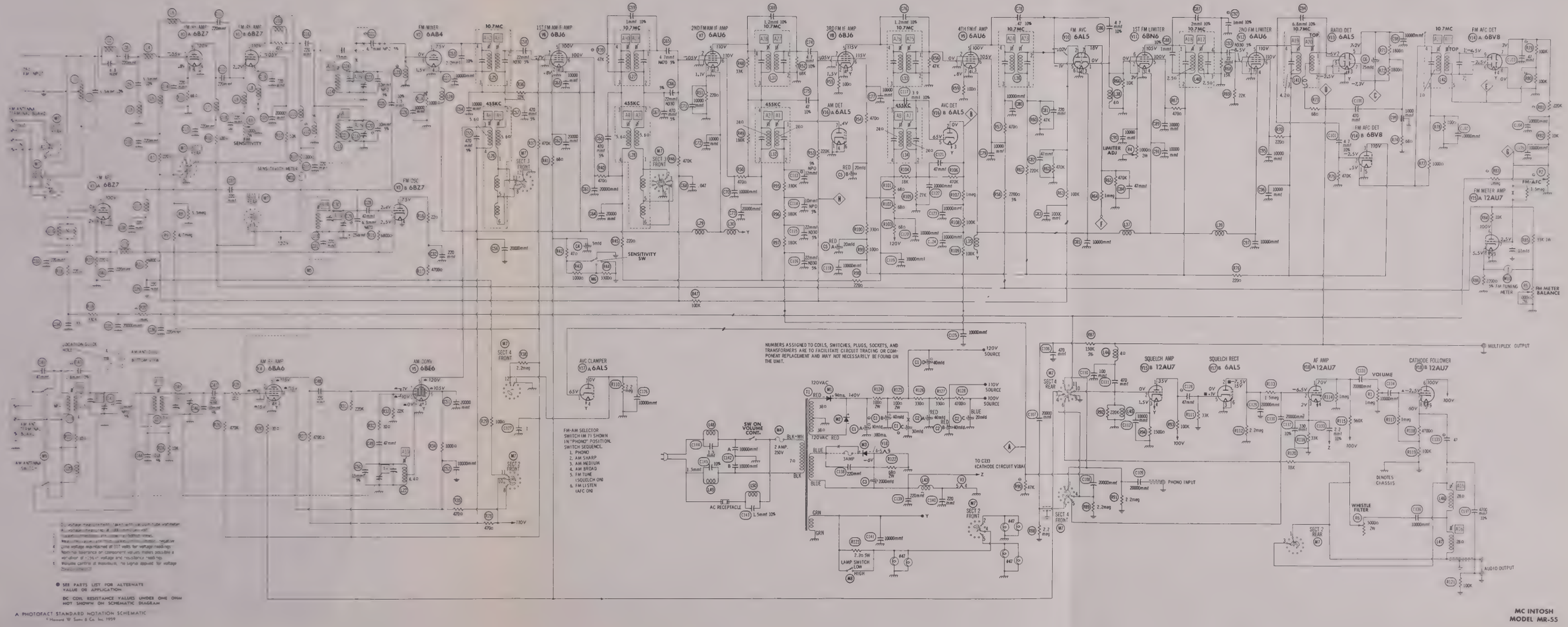
† MEASURED FROM OUTPUT OF M1 AND M2.

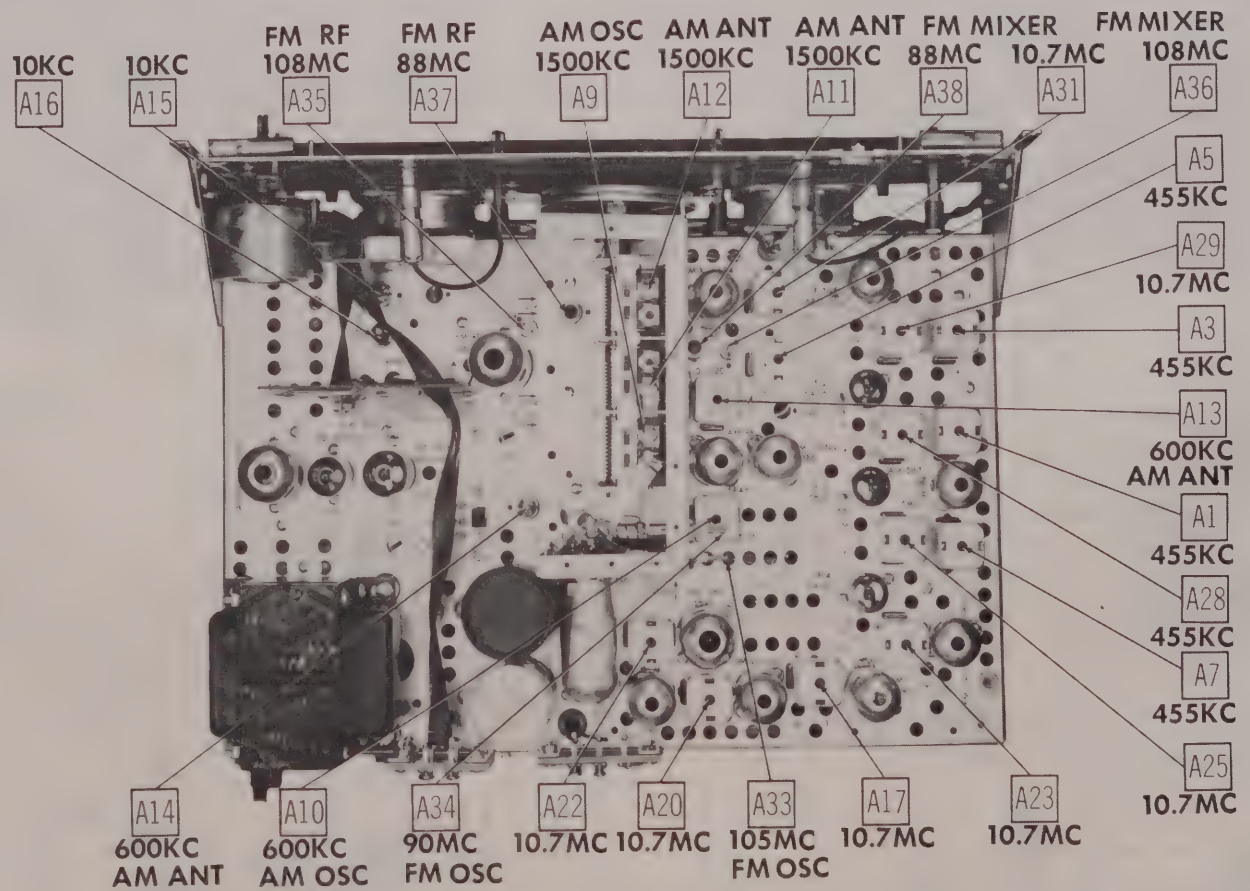
■ MEASURED IN "FM-TUNE" POSITION

▲ MEASURED FROM PIN 8 OF V18. NC NO CONNECTION



CHASSIS BOTTOM VIEW- INDUCTOR & ALIGN. IDENTIFICATION


FM R.F. AMP V1 A 6BZ7
FM R.F. AMP V1 B 6BZ7
FM MIXER V7 6AB4
10.7MC
1ST FM I.F. AMP V8 6BJ6
2ND FM AM I.F. AMP V7 6AU6
3RD FM I.F. AMP V8 6BJ6
4TH FM I.F. AMP V6 6AU6
FM AVC V10 6AL5
1ST FM LIMITER V11 6BN6
2ND FM LIMITER V12 6AU6
RATIO DET V13 6AL5
FM AFC DET V14 A 6BV8
FM AFC DET V14 B 6BV8
FM METER AMP V15 A 12AU7
FM OSC V3 B 6BZ7
455KC
AM DET V16 A 6AL5
AVC DET V16 B 6AL5
SENSITIVITY
SENSITIVITY SW
FM TUNING METER
FM METER BALANCE
LIMITER ADJ
AM R.F. AMP V4 6BA6
AM CONV V5 6BE6
AVC CLAMPER V11 A 6AL5
SQUELCH AMP V15 B 12AU7
SQUELCH RECT V17 B 6AL5
AF AMP V18 12AU7
CATHODE FOLLOWER V18 B 12AU7
VOLUME
PHONO INPUT
WHISTLE FILTER
AUDIO OUTPUT
MULTIPLEX OUTPUT
SW ON VOLUME CONT.
AC RECEPTACLE
LAMP SWITCH LOW HIGH
120V SOURCE
210V SOURCE
100V SOURCE
TO C133 (CATHODE CIRCUIT V18A)
SECT 1 FRONT
SECT 2 FRONT
SECT 2 REAR
SECT 3 FRONT
SECT 4 FRONT
SECT 4 REAR
LOCATION GUIDE
FM ANT.
AM ANT.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
FM-AM SELECTOR SWITCH (M 7) SHOWN IN "PHONO" POSITION. SWITCH SEQUENCE:
1. PHONO
2. AM SHARP
3. AM MEDIUM
4. AM BROAD
5. FM TUNE (SQUELCH ON)
6. FM LISTEN (AFC ON)
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co. Inc. 1959
MC INTOSH
MODEL MR-55



CHASSIS TOP VIEW - ALIGN IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A8, A17 thru A20, A23 thru A32	GENERAL CEMENT #5097, 8727 WALSCO #2515
A9, A11, A12	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A10, A13, A21, A22, A37, A38	GENERAL CEMENT #8606, 8606L, 8282, 9295 WALSCO #2526, 2543, 2544, 2545
A14, A15, A16	GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003 WALSCO #2516, 2519
A33 thru A36	GENERAL CEMENT #8721, 8722 WALSCO #2519

AM ALIGNMENT

Set antenna switch to "ANT" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of 6BE6 (V5). Low side to chassis.	455KC (Unmod.)	AM (Narrow)	Point of non-interference	DC probe to point (A). Common to chassis.	A1, A2, A3, A4, A5, A6	Adjust for maximum deflection with sensitivity switch in MINIMUM position.
2.	"	"	"	"	"	DC probe to point (B). Common to chassis.	A7, A8	Connect 1000Ω resistor across winding not being adjusted. Ground pin 2 of secondary. Adjust for maximum deflection.
3.	50mmf	Across antenna terminals.	1500KC	"	1500KC	DC probe to point (A). Common to chassis.	A9	Adjust for maximum deflection with sensitivity switch in maximum position.
4.	"	"	600KC	"	600KC	"	A10	"
5.	"	"	1500KC	AM (Broad)	1500KC	DC probe to pin 7 (grid) of 6BE6 (V5). Common to chassis.	A11, A12	Remove 6BE6 (V5). Connect 1500Ω resistor across capacitor not being adjusted. Adjust for maximum deflection.
6.	"	"	600KC	"	600KC	DC probe to pin 7 (grid) of 6BE6 (V5). Common to chassis.	A13, A14	Connect 1500Ω across coil not being adjusted. Adjust for maximum deflection. Repeat steps 5 and 6 until no further improvement is noticed. Replace V5.
7.	"	High side to pin 7 (grid) of 12AU7 (V18). Low side to chassis.	10KC	"		Output meter across audio output jack.	A15, A16 R6	Adjust for MINIMUM output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	.01mfd	High side to pin 5 (cathode) of 6AL5 (V10). Low side to chassis.	10.7MC (Unmod.)	FM (Tune)	Point of non-interference	DC probe thru 100K to pin 1 (grid) of 6AU6 (V12). Common to chassis.	R4	Adjust for maximum deflection.
9.	"	"	"	"	"	"	A17, A18	Connect 1500Ω across winding not being adjusted. Adjust for maximum deflection.
10.	"	"	"	"	"	DC probe thru 100K to point (C). Common to chassis.	A19	Adjust for maximum deflection.
11.	"	"	"	"	"	DC probe thru 100K to point (D). Common to chassis.	A20	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
12.	"	"	"	"	"	DC probe thru 100K to point (E). Common to chassis.	A21	Adjust for maximum deflection.
13.	"	"	"	"	"	Not used	R5	Short point (G) to chassis. Adjust R5 to center FM Tuning Meter.
14.	"	"	"	"	"	"	A22	Remove short and adjust A22 to center FM Tuning Meter.
15.	"	High side to pin 6 (grid) of 6AB4 (V2). Low side to chassis.	"	"	"	DC probe to point (F). Common to chassis.	A23, A24 A25, A26 A27, A28 A29, A30 A31, A32	Short point (H) to chassis. Connect 10K across winding not being adjusted. Adjust for maximum deflection. Remove short.

FIG. 1

FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

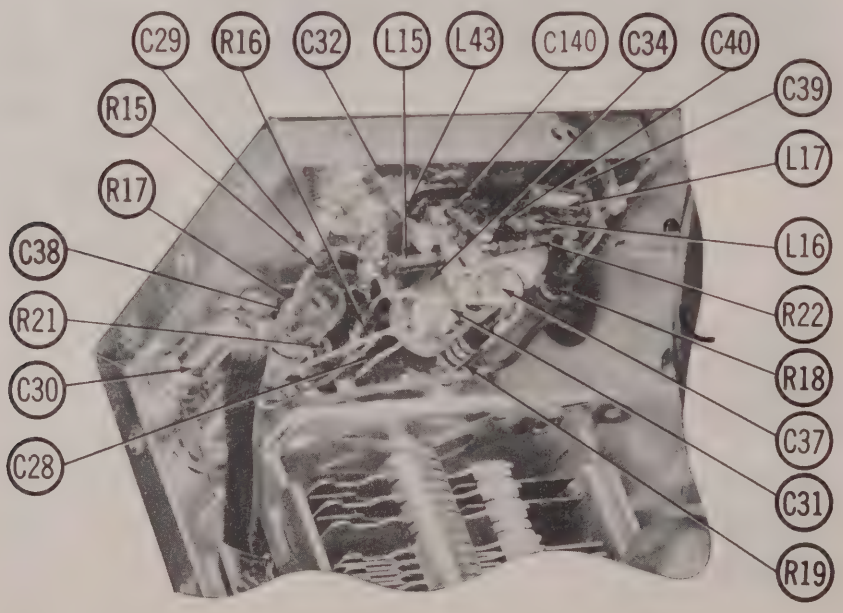
FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
8.	.01mfd	High side to pin 5 (cathode) of 6AL5 (V10). Low side to chassis.	10.7MC (450KC Swp.)	FM (Tune)	Point of non-interference	Vert. Amp. to pin 1 (grid) of 6AU6 (V12). Low side to chassis.	R4	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
9.	"	"	"	"	"	"	A17, A18	"
10.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A19	"
11.	"	"	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A20	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A19 for maximum amplitude and straightness of crossover lines.
12.	"	"	"	"	"	Vert. Amp. to point Ⓔ. Low side to chassis.	A21	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
13.	"	"	"	"	"	Not used	R5	Short point Ⓖ to chassis. Adjust R5 to center of FM Tuning Meter.
14.	"	"	"	"	"	"	A22	Remove short. Adjust A22 to center FM Tuning Meter.
15.	"	High side to pin 6 (grid) of 6AB4 (V2). Low side to chassis.	"	"	"	"	A23, A24 A25, A26 A27, A28 A29, A30 A31, A32	Short point Ⓗ to chassis. Connect 10K across winding not being adjusted. Adjust for curve of maximum amplitude. Remove short.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
16.	Two 270Ω Carbon Resistors	Across FM antenna terminal with 270Ω in each lead.	105MC (Unmod.)	FM (Tune)	105MC	DC probe to pin 7 (cathode) of 6AB4 (V2). Low side to chassis.	A33	Adjust for maximum deflection.
17.	"	"	90MC	"	90MC	"	A34	"
18.	"	"	108MC	"	108MC	"	A35, A36	Ground pin 2 of 6BZ7 (V3). Adjust for maximum deflection.
19.	"	"	88MC	"	88MC	"	A37, A38	Repeat steps 16, 17, 18 and 19 until no further improvement is noted. Remove ground at pin 2 of 6BZ7 (V3).



RF SUB CHASSIS

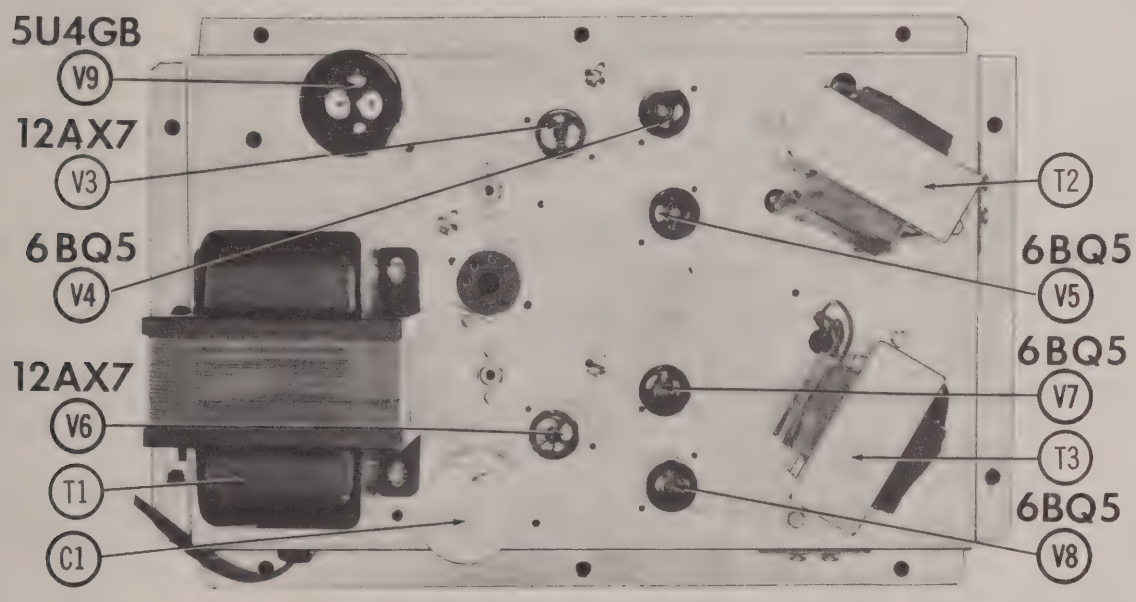
PHOTOFACT* Folder

MOTOROLA MODELS S14B, CW, M, W, SK13B, M, MC, SK14B, CW, M, W (Ch. HS-696, HS-709)

MOTOROLA MODELS S14B, CW, M, W, SK13B, M, MC, SK14B, CW, M, W (Ch. HS-696, HS-709)

TRADE NAME	Motorola Models SK13M, SK13B, SK13MC, SK14B, SK14CW, SK14M, SK14W (Preamp. Ch. HS-709, Amp. Ch. HS-696), S14 Right Channel Speaker System
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	AC Operated 2 Tube Stereo Preamplifier and 7 Tube Stereo Amplifier with 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 125 Watts, 1.2 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER VM23RC OR VM24RC - SEE SIMILAR V-M 1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10.



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

J171

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Left Channel Preamp. - Right Channel Preamp.	12AX7
V2	Left Channel AF Amp. - Right Channel AF Amp.	12AX7
V3	Left Channel AF Amp. - Left Channel Phase Inv.	12AX7
V4	Left Channel Output	EL84/6BQ5
V5	Left Channel Output	EL84/6BQ5
V6	Right Channel AF Amp. - Right Channel Phase Inv.	12AX7
V7	Right Channel Output	EL84/6BQ5
V8	Right Channel Output	EL84/6BQ5
V9	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▬40	400	23K642266	AFH4-79	D0663	FP447	TMQ-164	TVLS-4667.2*	
B	■40	400							
C	▲30	400							
D	20	25							
C2	5	10NP	23A632250	NP-PRS50V4	BBR10-25 †	TCN105		TVAS-1110 *	
C3	5	10NP	23A632250	NP-PRS50V4	BBR10-25 †	TCN105		TVAS-1110 *	
C4	10	400	23K642196	AFH1-44	A0440	FP142	TMS-49	TVAS-1655 *	

† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	2000			21K121836	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C6	10000			21R121946	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C7	.02	200		8R121003	P288N-02	DD-203	CUB2S2	GEM-212	2TM-S2	
C8	.02	400		8K128691	P488N-02	DD-203	CUB4S2	GEM-412	4TM-S2	
C9	2000			21K121836	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C10	100			21K125723	BPD-0001	DD-101	L10T1	CNO-310	5GA-T1	
C11	1000			21A121678	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C12	10000			21R121946	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C13	2000			21K121836	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C14	10000			21R121946	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C15	.02	200		8R121003	P288N-02	DD-203	CUB2S2	GEM-212	2TM-S2	
C16	.02	400		8K128691	P488N-02	DD-203	CUB4S2	GEM-412	4TM-S2	
C17	2000			21K121836	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C18	100			21K125723	BPD-0001	DD-101	L10T1	CNO-310	5GA-T1	
C19	1000			21A121678	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C20	10000			21R121946	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C21	470		10%	21K121797	DI-470	D6-471	BYA10T47	B-347	5GA-T47	
C22	.02	600	10%	8R122079			PM6S22	GEM-1612	6TM-S2S 10% *	
C23	220			21R410115	DI-220	D6-221	L10T22	B-322	5GA-T22	
C24	.02	600	10%	8R122079			PM6S22	GEM-1612	6TM-S2S 10% *	
C25	470		10%	21K121797	DI-470	D6-471	BYA10T47	B-347	5GA-T47	
C26	.02	600	10%	8R122079			PM6S22	GEM-1612	6TM-S2S 10% *	
C27	220			21R410115	DI-220	D6-221	L10T22	B-322	5GA-T22	
C28	.02	600	10%	8R122079			PM6S22	GEM-1612	6TM-S2S 10% *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	1/2	18A642216					Loudness, Left Channel *
B	1meg	1/2						Loudness, Right Channel *
R2A	2meg	1/2	18A642217	B-76	AD47-2meg-S	Q13-139		Treble, Left Channel
B	2meg	1/2		SR-76	Not Req.	M13-139	‡	Treble, Right Channel
C	Shaft			Not Req.	FS-3	Not Req.		
R3A	2meg	1/2	18A642217	B-76	AD47-2meg-S	Q13-139		Bass, Left Channel
B	2meg	1/2		SR-76	Not Req.	M13-139	‡	Bass, Right Channel
C	Shaft			Not Req.	FS-3	Not Req.		

CONTROLS (cont)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R4A	500K	1/2	18A642199	B-59	A47-500K-S	Q11-133	U50	Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWF-12	76-1	US26	

‡ "STA-LOC" Equivalent: FA26A, RU26A, CS3500. * Taps ⓐ 350K, 700K.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	MOTOROLA PART No.	NOTES
R5	1meg		6K124494	
R6	18K	1	6K129185	
R7	820Ω		6K121302	
R8	22K		6K119935	
R9	180K		6K125531	
R10	100K		6K125534	
R11	100K		6K125534	
R12	1800Ω		6K122445	
R13	100K		6K125534	
R14	1meg		6K124494	
R15	18K	1	6K129185	
R16	820Ω		6K121302	
R17	22K		6K119935	
R18	180K		6K125531	
R19	100K		6K125534	
R20	100K		6K125534	
R21	1800Ω		6K122445	
R22	100K		6K125534	
R23	4700Ω		6K121847	
R24	100K		6K122313	
R25	100K		6K122313	
R26	15K		6K119934	
R27	1800Ω		6K122445	

Note 1. Some versions may use 270K in this application.

ITEM No.	RATING OHMS	RATING WATT	MOTOROLA PART No.	NOTES
R28	220K		6K122322	
R29	100K		6K122313	
R30	1500Ω		6K127513	
R31	100Ω		6R6326	
R32	220K		6K122322	
R33	100Ω		6R6326	
R34	220K		6K122322	Note 1
R35	100K		6K122313	
R36	100K		6K122313	
R37	15K			
R38	1800Ω		6K122445	
R39	220K		6K122322	
R40	100K		6K122313	
R41	1500Ω		6K127513	
R42	100Ω		6R6326	
R43	220K		6K122322	
R44	82Ω	5	17K634893	
R45	100Ω		6R6326	
R46	220K		6K122322	Note 1
R47	330Ω	5	17K642037	
R48	4700Ω	1	6R5576	
R49	.47Ω		17K488266	Note 2

Note 2. Not used in some versions.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA	
K1	Loudness Compensation	50mmf, 100mmf, 3000mmf, 3000mmf, 100K, 100K	51B641643	Centralab Sprague	PC-325 TC-5
K2	Loudness Compensation	50mmf, 100mmf, 3000mmf, 3000mmf, 100K, 100K	51B641643	Centralab Sprague	PC-325 TC-5

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RATING SEC. 4	RATING SEC. 5	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ 1.2A	620VCT ⓐ .160A	5V ⓐ 3A	6.3VCT ⓐ 4.2A			25K642132				PC8422①		

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5500Ω CT	6-8Ω	25C641731	24S55 ①	A-2905	AU-609 ①	A-3880	24S55 ①	S-57Z ①	① Drill new mounting hole.
T3	5500Ω CT	6-8Ω	25C641731	24S55 ①	A-2905	AU-609 ①	A-3880	24S55 ①	S-57Z ①	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	12"	PM	8-10Ω	50K642739 ①	12A6AZ8.5 ①	① Used in SK13 Series. Parallel and phase.
SP2	12"	PM	8-10Ω	50K642739 ①	12A6AZ8.5 ①	② Used in SK13 Series, SK14 Series, Sl4 Series.
SP3	5 1/4"	PM	3-4Ω	50K634522 ①	52AlTZ3.6 ①	Parallel and phase.
SP4	5 1/4"	PM	3-4Ω	50K634522 ①	52AlTZ3.6 ①	③ 2 used in SK14 Series.
SP5	5"	PM	8-10Ω	50C638562 ②	5Al5TZ8.8 ②	④ Used in Sl4 Series.
SP6	5"	PM	8-10Ω	50C638562 ②	5Al5TZ8.8 ②	⑤ 2 used in SK14 Series. 1 used in Sl4 Series.
	15"	PM	8Ω	50C632259 ③		
	12"	PM	8Ω	50K642736 ④		
	5 1/4"	PM	16Ω	50K638577 ④		
	5 1/4"	PM	16Ω	50K638576 ⑤		
	5"	PM	8Ω	50C638562 ⑤		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	MOTOROLA PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		13-TB *				* Includes needles & mounting mechanism

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	MOTOROLA PART No.	JENSEN PART No.	WALCO PART No.	
M2		† S69X or †♦ S69SXD or ♦ S69XDD	* † W-103STSS or ♦†* W-103STD	* Includes Cartridge † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Lamp	65R125595	#1847
M4	Switch	40C642110	Compensation (5 Position, Rotary Wafer Type) Includes Power On-Off (SPST, Rotary Snap Type)
M5	Switch	40B642153	Stereo-Monaural (Rotary Wafer Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

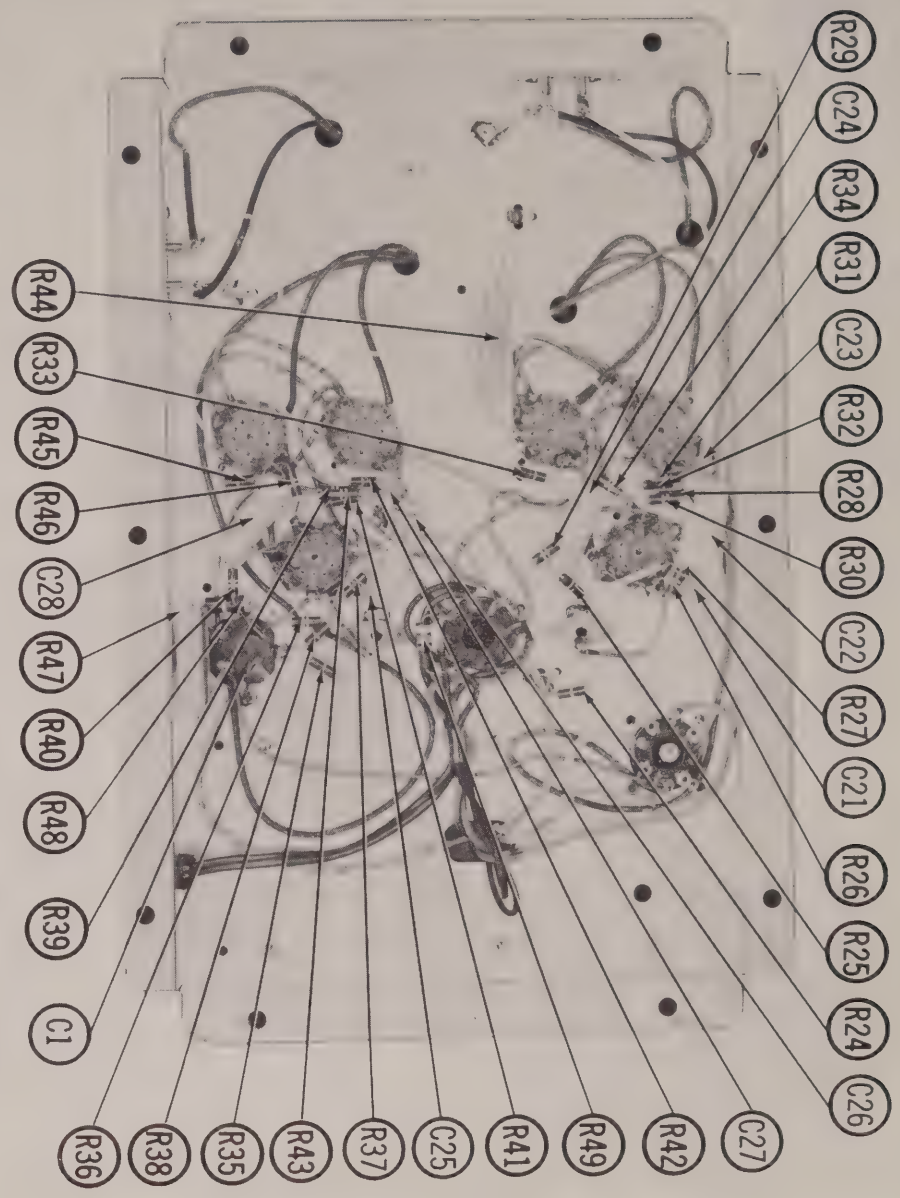
NAME	PART NO.	DESCRIPTION
Knob	36K642244	Balance, Models SK13B, MC, M, SK14B, CW, M, W
Knob	36K642243	Bass, Treble, Models SK13B, MC, M, SK14B, CW, M, W
Knob	36K642241	Compensation, Models SK13B, MC, M, SK14B, CW, M, W
Knob	36D642240	Function, Models SK13B, MC, M, SK14B, CW, M, W
Knob	36K642242	Loudness, Models SK13B, MC, M, SK14B, CW, M, W
Cabinet	16E642490	Mahogany, Models SK13M
Cabinet	16K642491	Blond Oak, Model SK13B
Cabinet	16K642492	Calif. Mahogany, Model SK13MC
Cabinet	16K642276	Blond Oak, Model SK14B
Cabinet	16E642440	Cherry, Model SK14CW
Cabinet	16E642275	Mahogany, Model SK14M
Cabinet	16K642277	Walnut, Model SK14W
Cabinet	16K642141	Blond Oak, Model Sl4B
Cabinet	16E642330	Cherry, Model Sl4CW
Cabinet	16E642140	Mahogany, Model Sl4M
Cabinet	16K642142	Walnut, Model Sl4W
Legs	16K642497	Model SK13M
Legs	16K642498	Model SK13B
Legs	16K642488	Model SK13MC

WIRING DATA

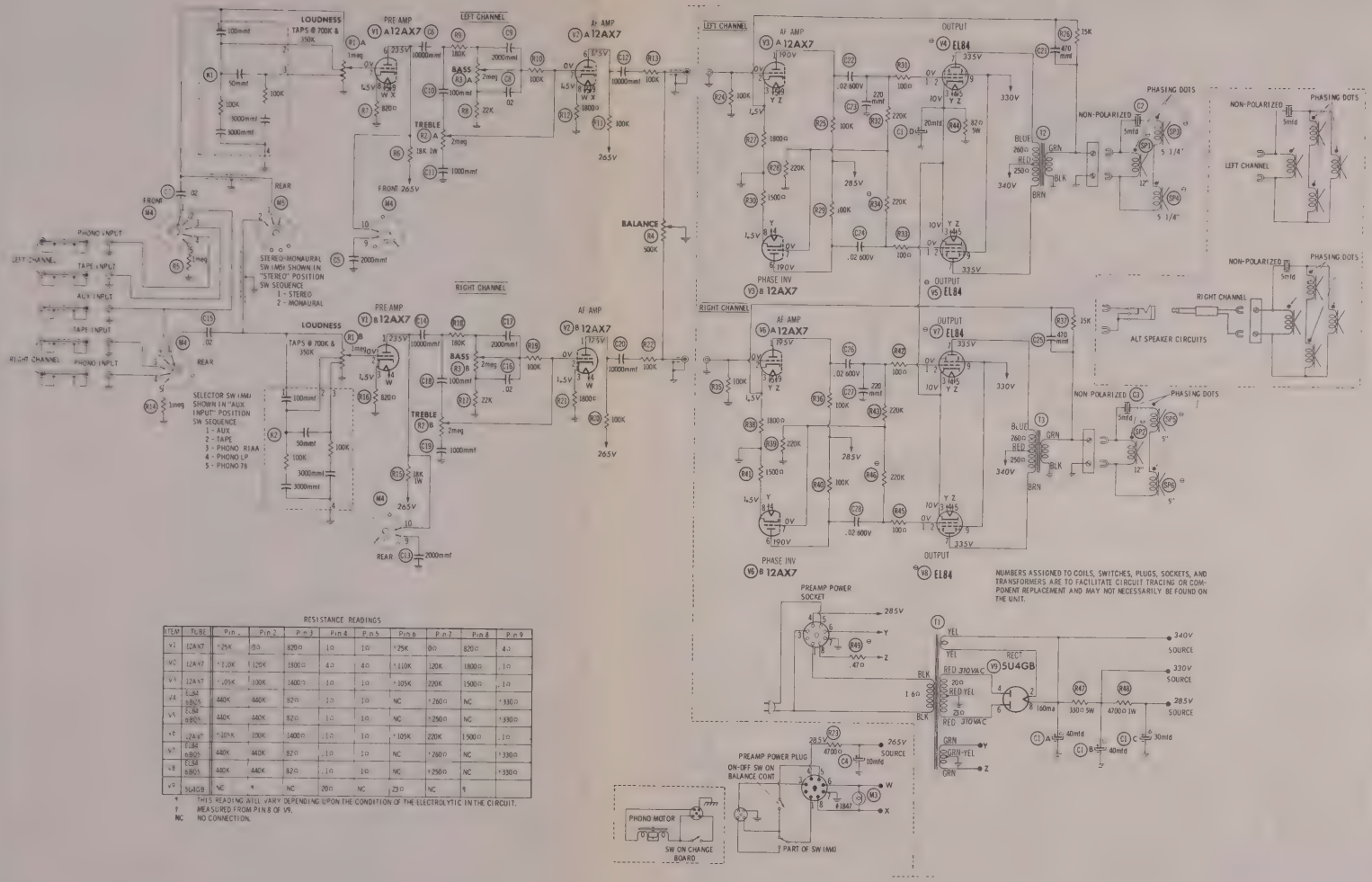
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

AMP CHASSIS BOTTOM VIEW



PREAMP CHASSIS - BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	*25K	100Ω	820Ω	1Ω	1Ω	*25K	0Ω	820Ω	4Ω
V2	12AX7	*1.0K	120K	1800Ω	4Ω	4Ω	*110K	120K	1800Ω	1Ω
V3	12AX7	*105K	100K	1400Ω	1Ω	1Ω	*105K	220K	1500Ω	1Ω
V4	EL84 or 6BQ5	440K	440K	820Ω	1Ω	1Ω	NC	*260Ω	NC	*330Ω
V5	EL84 or 6BQ5	440K	440K	820Ω	1Ω	1Ω	NC	*250Ω	NC	*330Ω
V6	12AX7	*105K	100K	1400Ω	1Ω	1Ω	*105K	220K	1500Ω	1Ω
V7	EL84 or 6BQ5	440K	440K	820Ω	1Ω	1Ω	NC	*260Ω	NC	*330Ω
V8	EL84 or 6BQ5	440K	440K	820Ω	1Ω	1Ω	NC	*250Ω	NC	*330Ω
V9	5U4GB	NC	†	NC	20Ω	NC	2Ω	NC	†	

* THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V9.
NC NO CONNECTION.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W Sams & Co, Inc 1959

MOTOROLA MODELS S14B, CW, M, W, SK13B, M, MC, SK14B, CW, M, W (Ch. HS-696, HS-709)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

OLYMPIC
MODEL 688

OLYMPIC
MODEL 688

OLYMPIC
MODEL 688

TRADE NAME	Olympic Model 688
MANUFACTURER	Olympic Radio & Tel. Corp., 34-01 38th Ave., Long Island City 1, N. Y.
TYPE SET	AC Operated 5 Tube AM Receiver With 4 Speed Automatic Record Changer
POWER SUPPLY	105-120 Volts AC, 60 Cycles
RATING	28 Watts, .3 Amp. @ 117 Volts AC (Radio)
TUNING RANGE—BROADCAST	540KC-1620KC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR ADMIRAL RC607-1 — PHOTOFACT SET 398 FOLDER 7

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A4..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna lug of tuning gang. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001mfd to reduce hum modulation.
2.		Loop	1500KC	Tune to 1500KC Signal	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of J150

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■60	150	①	AFH3-81	C0600	FP311.1	TMT-67	TVL-3432	
B	▲60	150							
C	25	25	①						

① In some versions, C1C may use 20mfd (C1 Part #C0-4093).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	10		N750 10%		N750 DI 10	DTN-10	C10Q1U	CN7-410	5TCU-Q1S 10%*	①
C3	.02	600		COH6203	P688N-02	DD-203	CUB6S2	GEM-612	6TM-S2	
C4	1000			CCD102M	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C5	.005	600		COH6502	P688N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C6	.005	600		COH6502	P688N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C7	.1	400		COH4104	P488N-1	DF-104	CUB4P1	GEM-411	4TM-P1	
C8	.047	400		COH4503	P488N-047	DF-503	CUB4S47	GEM-4S47	4TM-S47	
C9	.047	400		COH4503	P488N-047	DF-503	CUB4S47	GEM-4S47	4TM-S47	
C10	.1	400		COH4104	P488N-1	DF-104	CUB4P1	GEM-411	4TM-P1	
C11	.1	400		COH4104	P488N-1	DF-104	CUB4P1	GEM-411	4TM-P1	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Not used in some versions.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	PT-567	BT-80	A47F6-2meg-F	Q13-139X	UT-449	Volume, Tap @ 600K
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	3meg	½	PT-2160	B-85	A47-3meg-Z	Q13-140	U-57	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-3	SWE-21	76-1	US-28	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	OLYMPIC PART No.	NOTES
R3	2.2meg		REB225M	
R4	22K		REB223M	
R5	68Ω		REB680M	
R6	470K		REB474M	
R7	150Ω		REB151K	

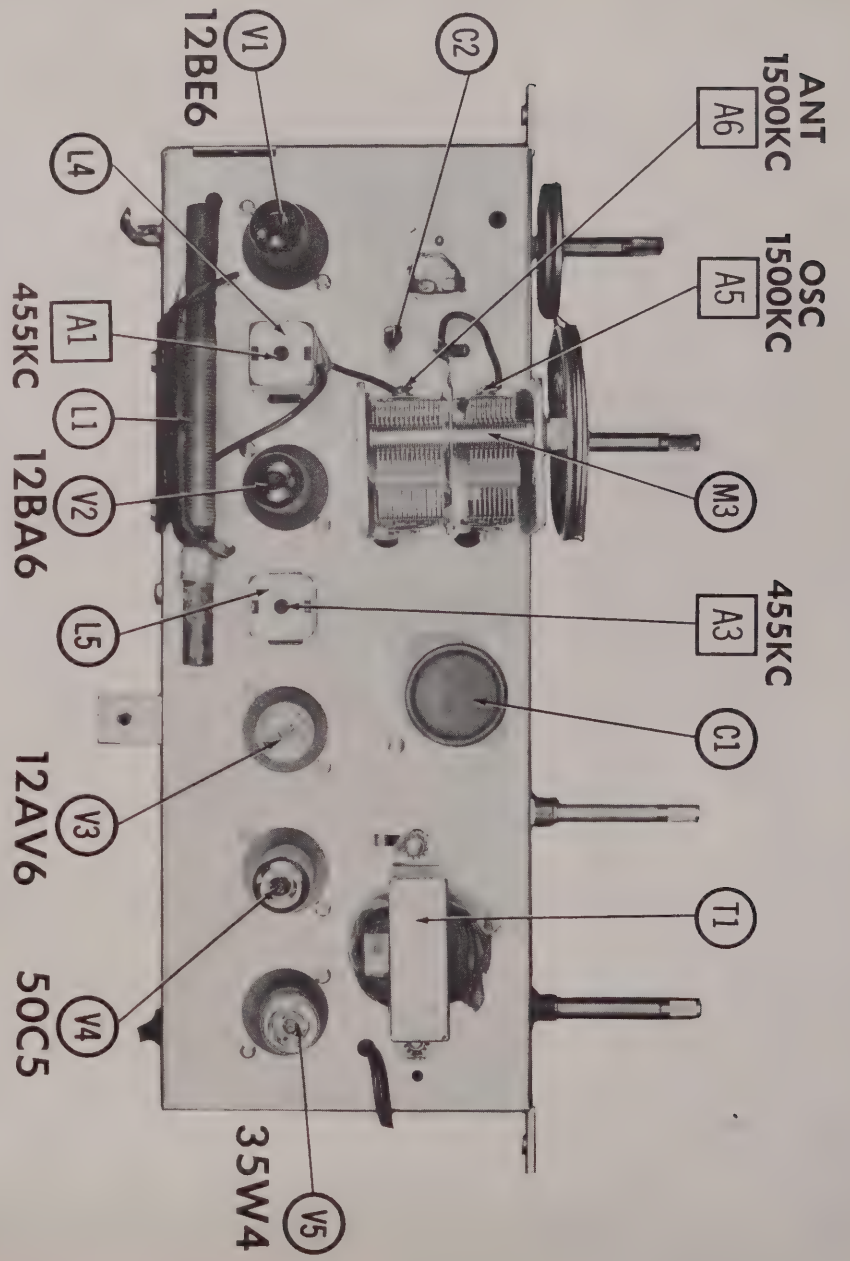
ITEM No.	RATING OHMS	RATING WATT	OLYMPIC PART No.	NOTES
R8	1meg		REB105M	
R9	1000Ω	2	RED102M	
R10	180Ω	1	REC181M	
R11	220K		REB224M	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA OLYMPIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loopstick	LP25351						
L2	Osc. Coil	CL2709	14-1073	14-1073		69-OSC *		1.7uh
L3	RF Choke	①						
L4	Input IF	TR1644	16-6758	16-6758	BC-352	12-C1	RF-1	
L5	Output IF	TR1645	16-6758	16-6758	BC-353	12-C2	RF-2	

* Drill Mtg. Hole.
① 12 Turns #20 Insulated Wire Wound On C11.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2400Ω Tap ⓐ 3%	3-4Ω	TR2690-1	24S50A①	A3031①		A3330①	24S50A①	S-16X①	① Drill new mounting hole

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: OLYMPIC PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	SK4342	4A07	
SP2	4"	PM	3-4Ω	SK4342	4A07	
SP3	8"	PM	3-4Ω	SK1906-2	8A31	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA	
K1	Diode RF Filter	150mmf, 150mmf, 47K	PC2478	Aerovox Centralab Cornell-Dubilier Sprague	PA-98 PC-51 11TM2 D2
K2	Audio Coupling	220mmf, 250mmf, 2000mmf, 5000mmf, 470K, 470K, 6.8meg	PC2477	Aerovox Centralab Cornell-Dubilier Sprague	PA-113-1 PC-150 116TM1 DT-1

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: OLYMPIC PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1		* 93-T				* Includes Needles

PHONO NEEDLE
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: OLYMPIC PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2			W-201TPS † or W-201DS ♦†	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M3	Tuning Cap	CV3120	Two Gang (Ant. 26—495mmf, Osc. 21—177mmf.)
M4	Bandswitch	SW2689	

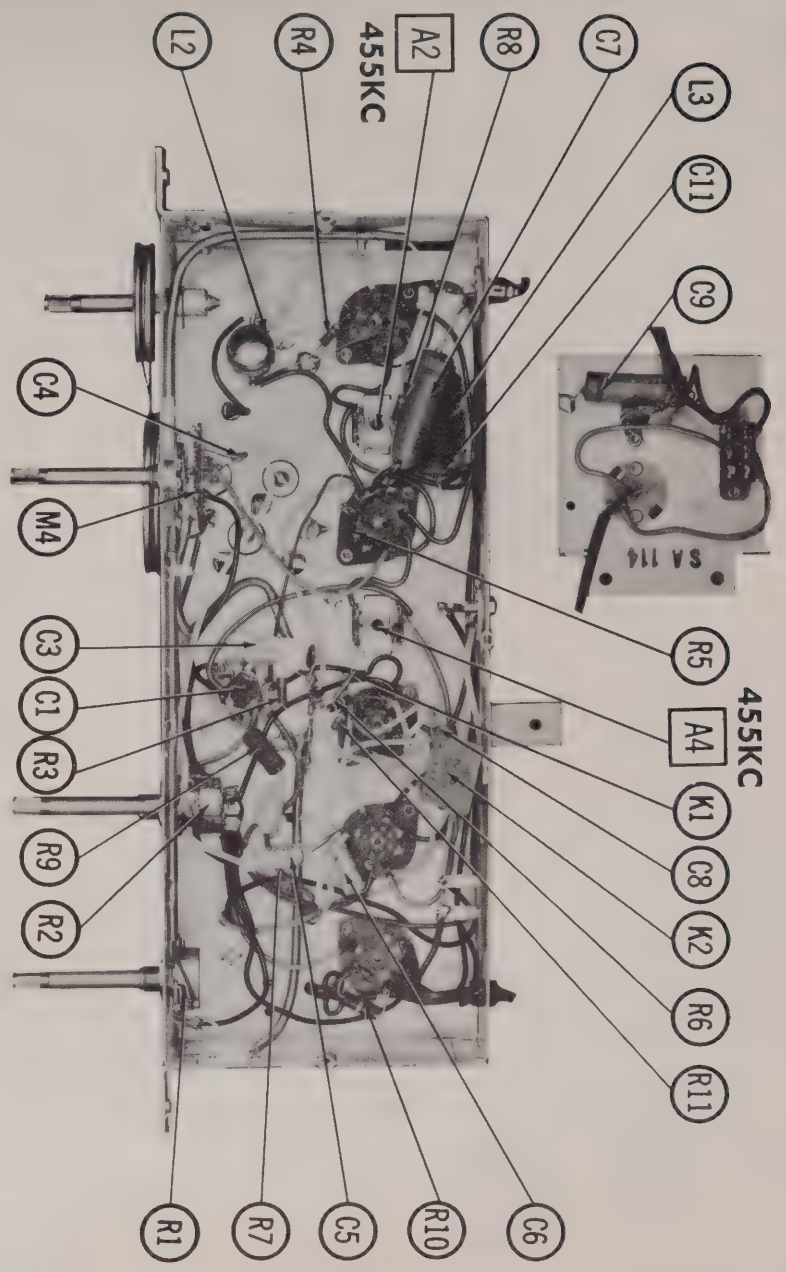
CABINETS & CABINET PARTS
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

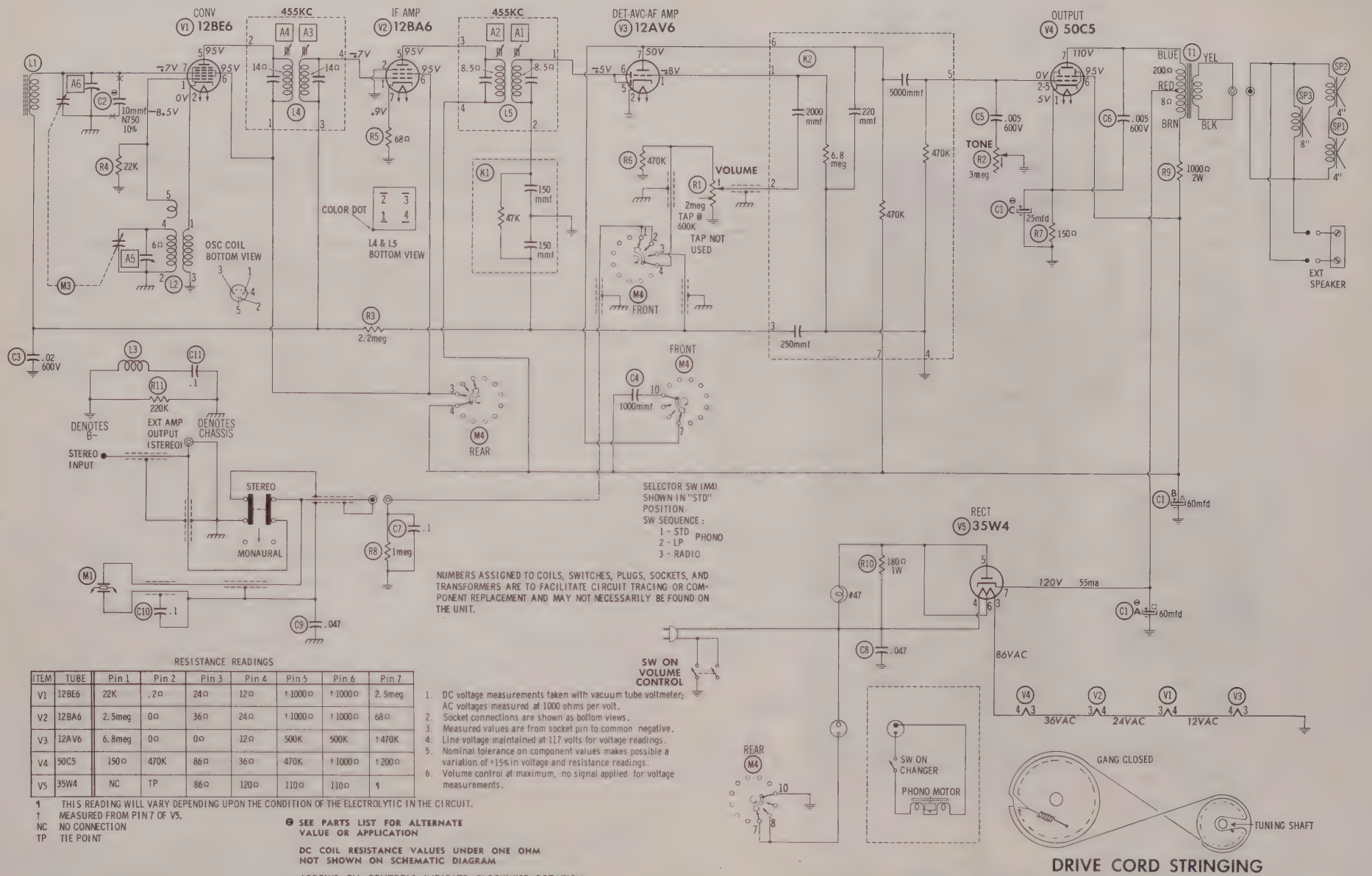
NAME	PART NO.	DESCRIPTION
Knob	KN25426	Tuning
Knob	KN25428	Volume, Tone On-Off, AM-Phono

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.2Ω	24Ω	12Ω	†1000Ω	†1000Ω	2.5meg
V2	12BA6	2.5meg	0Ω	36Ω	24Ω	†1000Ω	†1000Ω	68Ω
V3	12AV6	6.8meg	0Ω	0Ω	12Ω	500K	500K	†470K
V4	50C5	150Ω	470K	86Ω	36Ω	470K	†1000Ω	†200Ω
V5	35W4	NC	TP	86Ω	120Ω	110Ω	110Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1959

OLYMPIC MODEL 688

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

REGENCY MODELS
RP-3, TR-22

REGENCY MODELS
RP-3, TR-22

TRADE NAME	Regency Models RP-3, TR-22
MANUFACTURER	Regency Div., I. D. E. A., Inc., 7900 Pendleton Pike, Indianapolis 26, Ind.
TYPE SET	Battery Operated Transistorized Portable AM Receiver (Model RP-3 is 3 Speed Manual Record Player)
POWER SUPPLY	4.5 Volts DC
RATING	5.2MA @ 4.5 Volts DC (No Signal, Min. Volume) 15MA @ 4.5 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	535KC-1630KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: A1 .... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

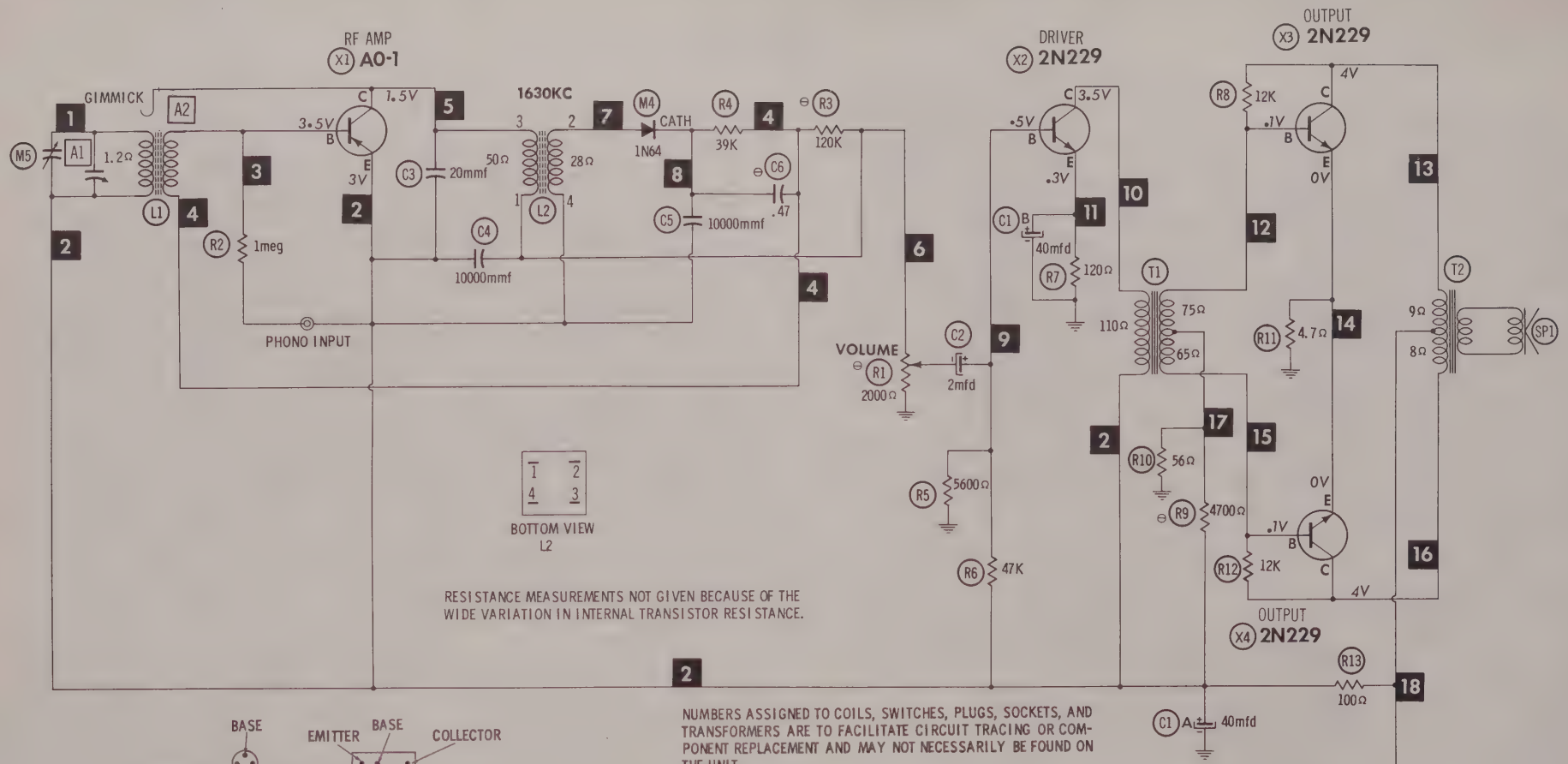
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	1630KC (400∿ Mod)	Tuning gang fully open	Across voice coil	A1	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	With tuning closed, slide antenna toward tuning gang until oscillation occurs, then back away until oscillation stops.						
3.		None		Tuning gang fully open	Across voice coil	A2	Adjust until oscillation starts, then until oscillation stops. Repeat steps 2 and 3.
4.	Tune across band and check for oscillations. If oscillations are noted slide antenna away from tuning gang until oscillation stops.						

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

J183

SET 453 FOLDER 11



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

© Howard W. Sams & Co., Inc. 1959

REGENCY MODELS RP-3, TR-22

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	AO-1	RF Amp.					PNP
X2	2N229	Driver					NPN
X3	2N229	Output					NPN
X4	2N229	Output					NPN

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	REGENCY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	40	10	300-820	BCD10X5050	BBRD4415	TCD48	TDLD-7	TVA-2445	
B	40	10							
C2	2	3	300-473-8	PWE3002	EC2-3	TT6X2	ML2-6	TE-1051	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	REGENCY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	20			100-772-10	DI-20	DD-200	L10Q2	ZT-542	5GA-Q2	
C4	10000				BPD-01	DD-103	BYA10D1	B-110	5HK-S1	
C5	10000				BPD-01	DD-103	BYA10D1	B-110	5HK-S1	
C6	.47					TCZ-R5				①
C7	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C8	50000				BPD-05	DF-503	H-05S5	BT-150	5HK-S5	

① Some versions may use .56mmf in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	REGENCY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2000Ω	½	300-621-1 ①					Volume & Switch

① Some versions may use Part #300-621-2.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REGENCY PART No.	NOTES
	OHMS	WATT		
R2	1meg			Note 1
R3	120K			
R4	39K			
R5	5600Ω			
R6	47K			
R7	120Ω			

ITEM No.	RATING		REGENCY PART No.	NOTES
	OHMS	WATT		
R8	12K			Note 2
R9	4700Ω			
R10	56Ω			
R11	4.7Ω			
R12	12K			
R13	100Ω			

Note 1. Some versions may use 100K, 150K or 220K in this application.
Note 2. Some versions may use 2700Ω, 3300Ω, 3900Ω in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		REGENCY PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	300-808						
L2	Detector Coil Assy.	101-028						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	REGENCY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1 :	1	300-781	TR-64①			TR-64①		① Bend tabs down

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	REGENCY PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	200Ω CT	3-4Ω	300-784							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	REGENCY PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	500-340	4A07	

BATTERIES

ITEM No.	VOLTAGE	REGENCY PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	4.5V			2R		950		M13R	① Radio, 3 Used
M2	6V			2R		950		M13R	② Phono, 4 Used

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	REGENCY PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M3		314-TS	N8-1 and N8-3			

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE REPLACEMENT CARTRIDGE LISTED.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		REGENCY PART No.	CBS PART No.	SYLVANIA PART No.	
M4	1N64		1N64	1N64	Detector (Pigtail Leads)

MISCELLANEOUS

ITEM No.	PART NAME	REGENCY PART No.	NOTES
M5	Tuning Cap.	300-825	1 Section Ant. 10 – 237mmf
M6	Switch		Phono Off-On (SPST, Slide Type)
	Printed Board	500-432	

CABINETS & CABINET PARTS

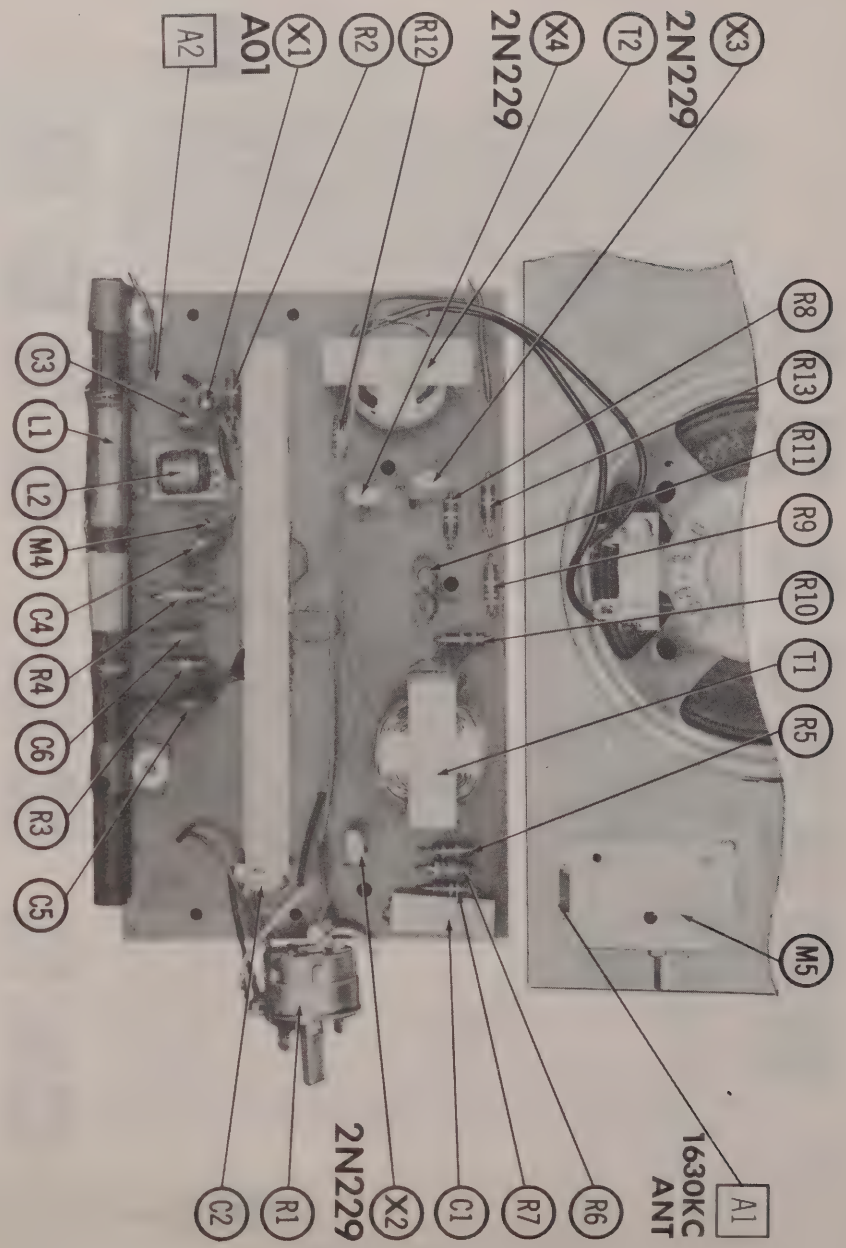
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	300-796	Tuning
Knob	300-797	Volume
Case	500-434	Leather
Case	600-612	Wood

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER

**SHARP MODEL
TR-182**

SHARP MODEL
TR-182

SHARP MODEL
TR-182

TRADE NAME	Sharp Model TR-182
IMPORTER	Continental Merchandise Co., Inc., 236 Fifth Ave., New York 1, N. Y.
TYPE SET	Battery Operated Transistorized AM Portable Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	535KC — 1605KC
RATING	5.9MA @ 9 Volts DC (No Signal, Min. Volume) 8.5MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

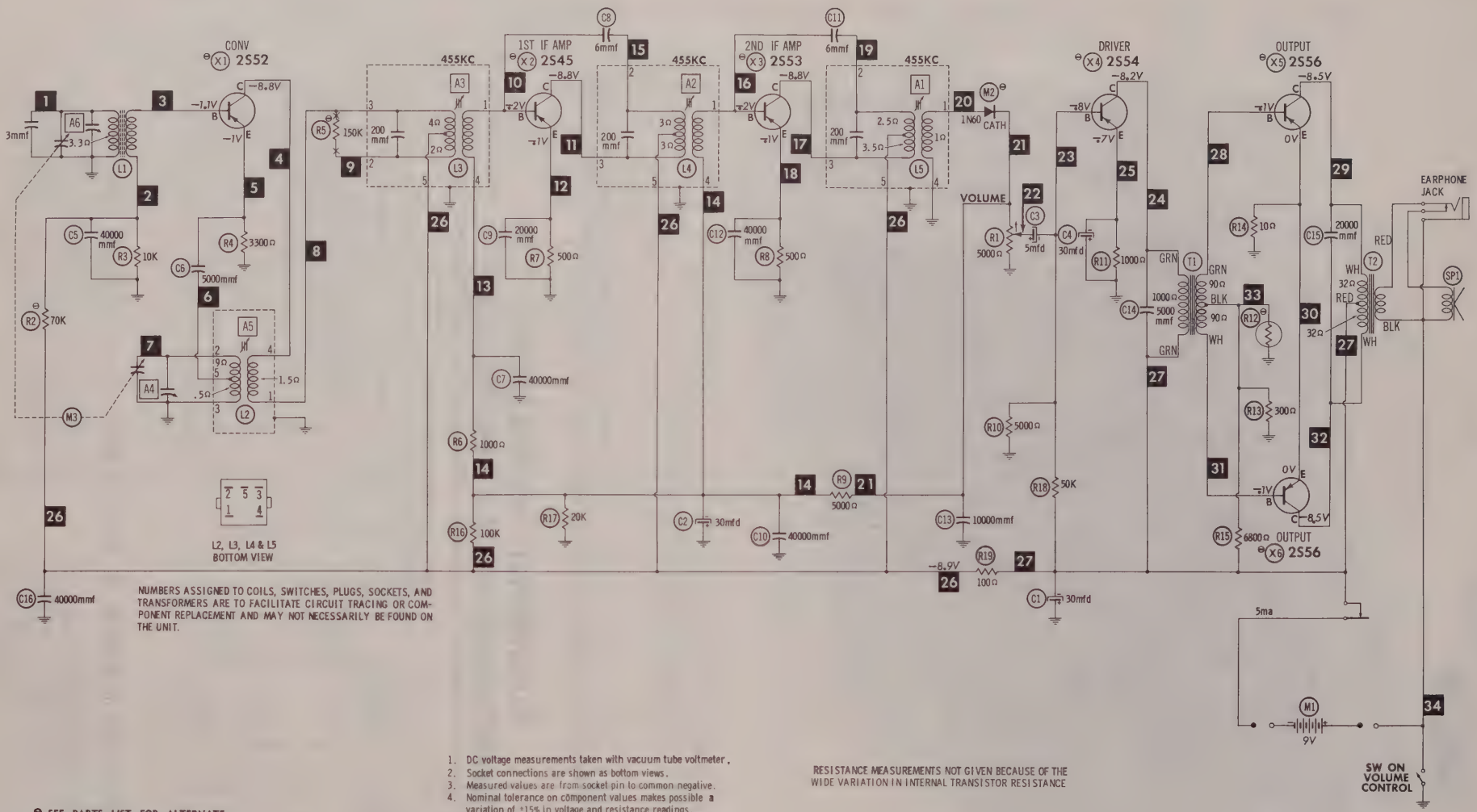
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A4, A6..... GENERAL CEMENT #9087, 9089
WALSCO #2528

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1605KC	"	"	A4	"
3.		"	600KC	600KC	"	A5	"
4.		"	1400KC	1400KC	"	A6	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1959

SHARP MODEL TR-182

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S52①	Converter		2N411	2N486		PNP
X2	2S45②	1st IF Amplifier		2N409	2N483		PNP
X3	2S53②	2nd IF Amplifier		2N409	2N482		PNP
X4	2S54③	Driver		2N407	2N362		PNP
X5	2S56④	Output		2N407	2N633		PNP
X6	2S56④	Output		2N407	2N633		PNP

① Alternate HJ23D ② Alternate HJ22D ③ Alternate HJ15 ④ Alternate HJ17

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	SHARP PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	10		XPP-10030	NLW30-15	TT15X30	ML30-15	TE-1158	
C2	30	6		XPP-6030	EC30-6	TT6X30	ML30-6	TE-1092	
C3	5	6		XPP-6005	EC5-6	TT6X5	ML5-6	TE-1084	
C4	30	6		XPP-6030	EC30-6	TT6X30	ML30-6	TE-1092	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	SHARP PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	40000				C-80V503AM	DA-503	H-05S5	TA-150	TG-S50	
C6	5000				C-80V502AM	DM-502	H-05D5	TA-250	TG-D5	
C7	40000				C-80V503AM	DA-503	H-05S5	TA-150	TG-S50	
C8	6					DD-060	C10V6C		5GA-V6	
C9	20000				C-80V203AM	DA-203	H-05S2	TA-120	TG-S20	
C10	40000				C-80V503AM	DA-503	H-05S5	TA-150	TG-S50	
C11	6					DD-060	C10V6C		5GA-V6	
C12	40000				C-80V503AM	DA-503	H-05S5	TA-150	TG-S50	
C13	10000				C-80V103AM	DM-103	H-05S1	TA-110	TG-S10	
C14	5000				C-80V502AM	DM-502	H-05D5	TA-250	TG-D5	
C15	20000				C-80V203AM	DA-203	H-05S2	TA-120	TG-S20	
C16	40000				C-80V503AM	DA-503	H-05S5	TA-150	TG-S50	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SHARP PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	33.10	B16-214				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SHARP PART No.	NOTES
	OHMS	WATT		
R2	70K			Note 1
R3	10K			
R4	3300Ω			
R5	150K			Note 2
R6	1000Ω			
R7	500Ω			
R8	500Ω			
R9	5000Ω			
R10	5000Ω			

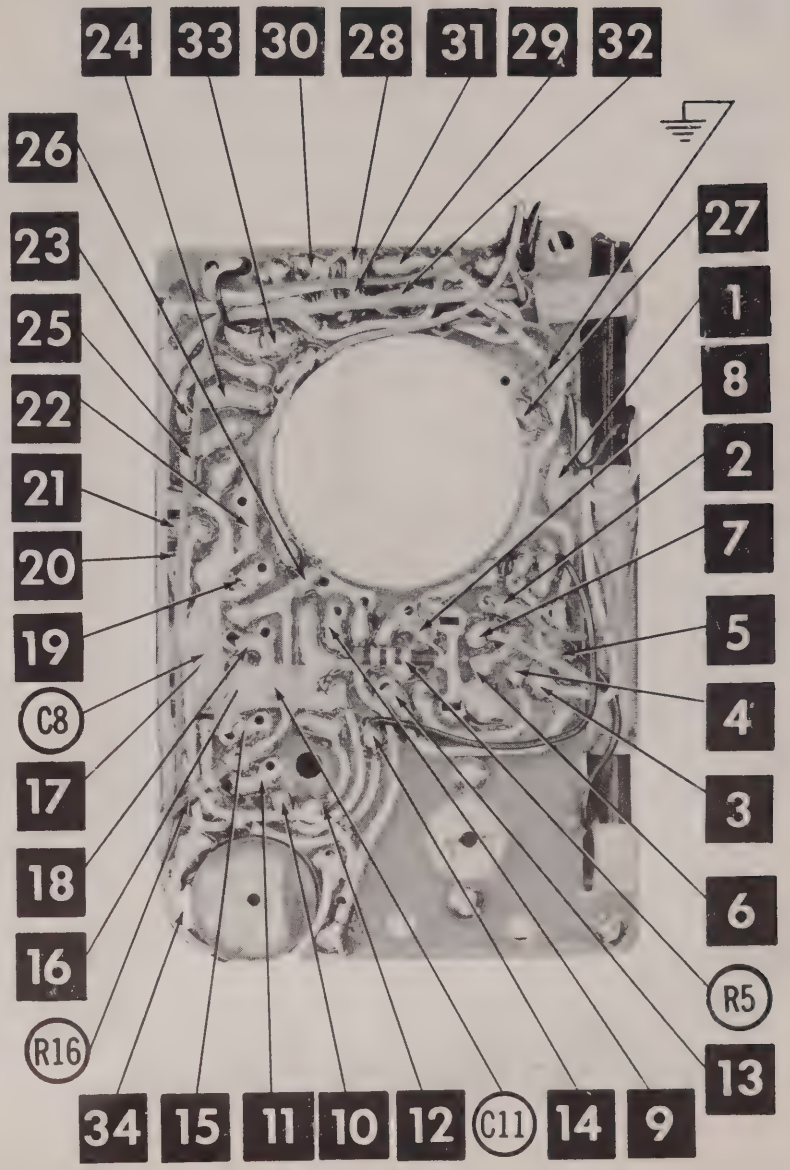
Note 1. A 150K is used in some versions.
Note 2. Not used in some versions.

ITEM No.	RATING		SHARP PART No.	NOTES
	OHMS	WATT		
R11	1000Ω			Note 3
R12				
R13	300Ω			
R14	10Ω			
R15	6800Ω			
R16	100K			
R17	20K			
R18	50K			
R19	100Ω			

Note 3. Temperature Compensating Unit.

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SHARP PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick							
L2	Osc. Coil							
L3	1st IF Trans.							
L4	2nd IF Trans.							
L5	3rd IF Trans.							

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SHARP PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5 :	1	T-453						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SHARP PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1100Ω CT	10-12Ω	OT-503				TA-26			

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SHARP PART No.	QUAM PART No.	
SP1	2 1/4"	PM	10-12Ω	PM-224A		

BATTERIES

ITEM No.	VOLTAGE	SHARP PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			2U6		216		M-1604 TR146R①	① Mercury Type

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SHARP PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N60 *		1N60	1N60	Detector (Pigtail)

* Some versions may use 1N34A in this application.

MISCELLANEOUS

ITEM No.	PART NAME	SHARP PART No.	NOTES
M3	Tuning Cap.		2 Gang

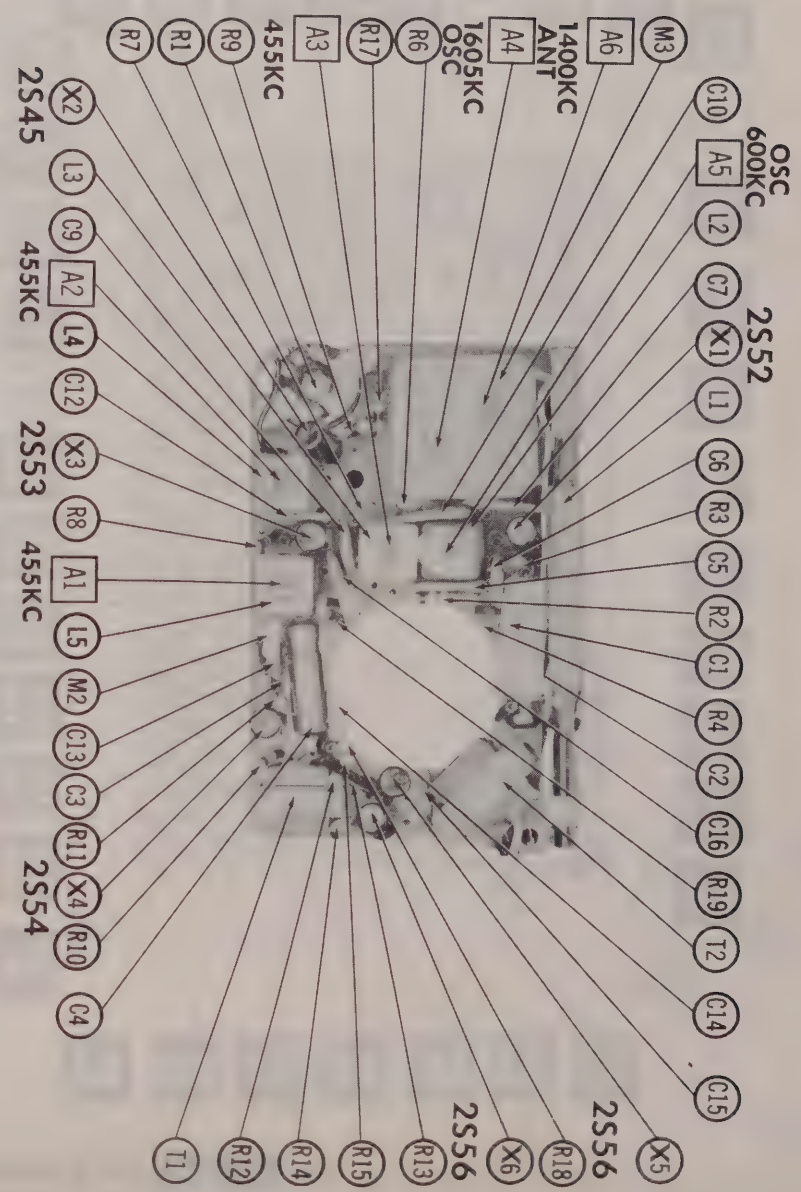
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT* Folder

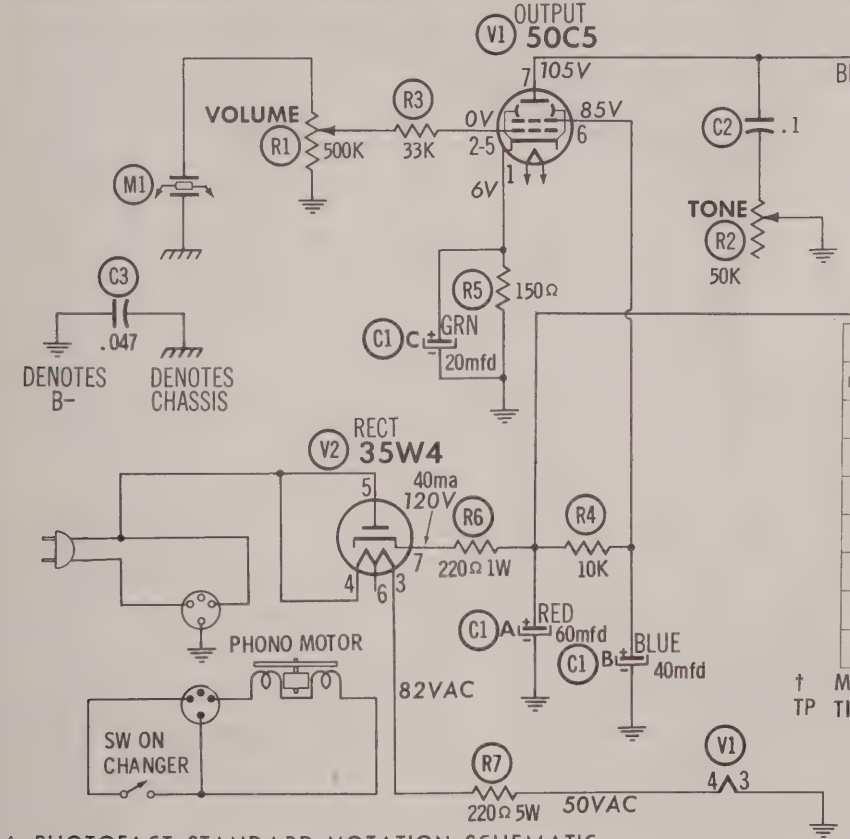
EIA

WESTINGHOUSE MODELS H-43AC1, H-43AC2

WESTINGHOUSE MODELS
H-43AC1, H-43AC2

TRADE NAME	Westinghouse Models H-43AC1, H-43AC2
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.
TYPE SET	AC Operated 2 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 24 Watts, .25 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR MONARCH UA8 — PHOTOFACT SET 381 FOLDER 11



Pin No.	V1 50C5	V2 35W4
1	150Ω	TP
2	33K	TP
3	0Ω	270Ω
4	50Ω	300Ω
5	33K	300Ω
6	†10K	280Ω
7	†460Ω	20K(Min)

† MEASURED FROM PIN 7 OF V2
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1959

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of J17

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SET 453 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	50C5	

ITEM No.	USE	TYPE	NOTES
V2	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	218V025H27	AFH3-12	C0110	WT407	TMT-11	TVL-3443	
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C3	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	690V020H62	B-59	A47-500K-S	Q11-133	U50	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	50K	½	690V020H65	B-31	A47-50K-S	Q11-123	U35	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Westinghouse PART No.	NOTES
R3	33K			
R4	10K			
R5	150Ω			

ITEM No.	RATING OHMS	RATING WATT	Westinghouse PART No.	NOTES
R6	220Ω	1		
R7	220Ω	5	690V020H51	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2350Ω	3-4Ω	690V020H58	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

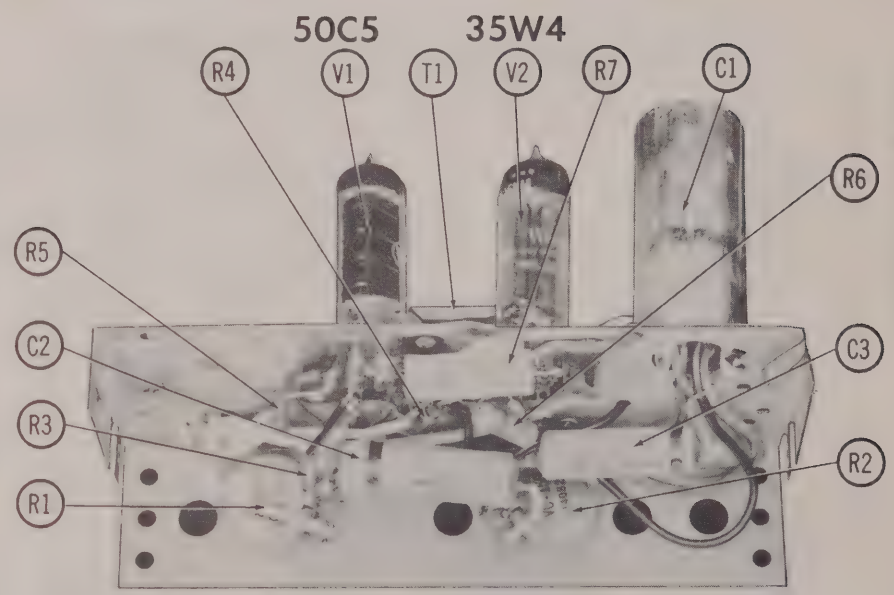
ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Westinghouse PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	690V020H54	4A07	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA Westinghouse PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1	TC800	310-TB	N8-1 and N8-3			

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA Westinghouse PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	BS-250 (78)	† CRA55 or ♦ CRA55D		† Jewel ♦ Diamond
	BS-100 (LP)	† CRA55LP or ♦ CRA55LPD		

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	690V020H39	Volume, Tone
Cabinet	690V020H07	Charcoal And White, Model H-43AC1
Cabinet	690V020H08	Brown And White, Model H-43AC2

WIRING DATA

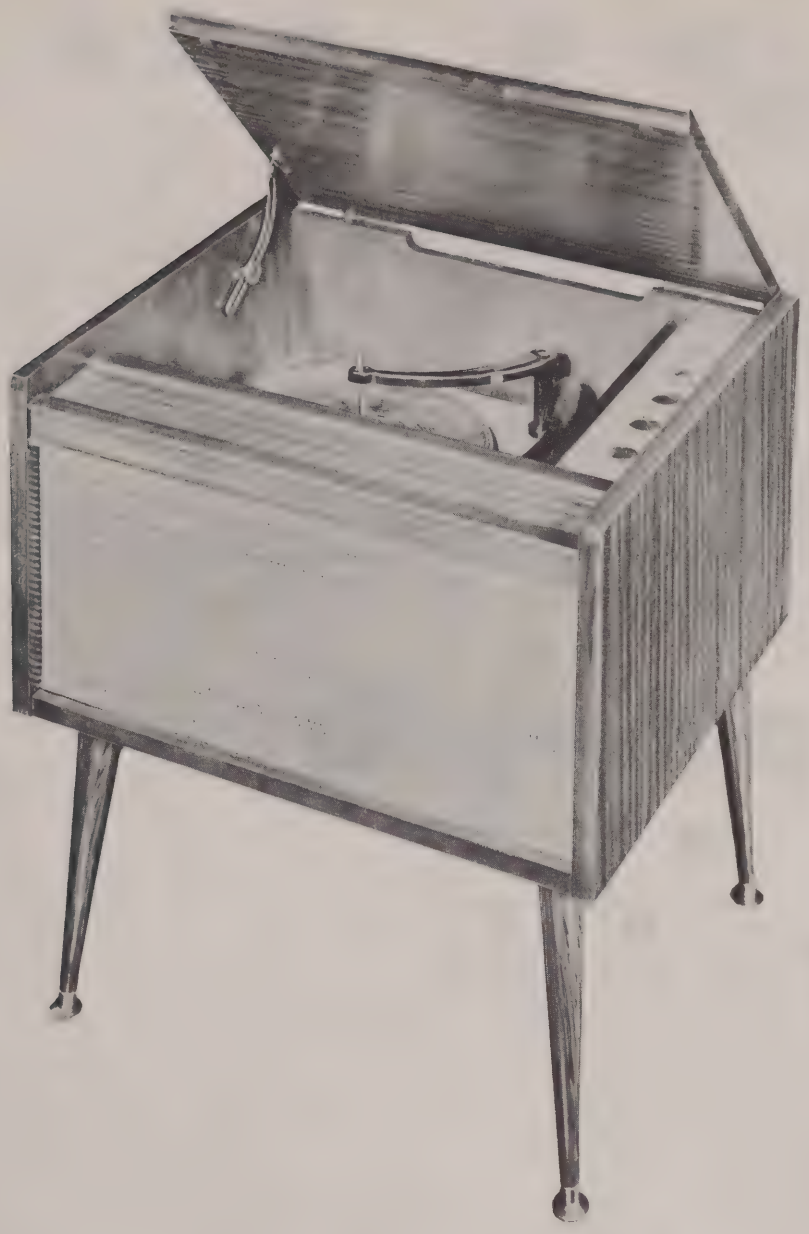
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

WESTINGHOUSE MODELS H-46AC1, 2, 3 (Ch. V-2503-3)

WESTINGHOUSE MODELS
H-46AC1, 2, 3 (Ch. V-2503-3)



WESTINGHOUSE MODELS
H-46AC1, 2, 3 (Ch. V-2503-3)

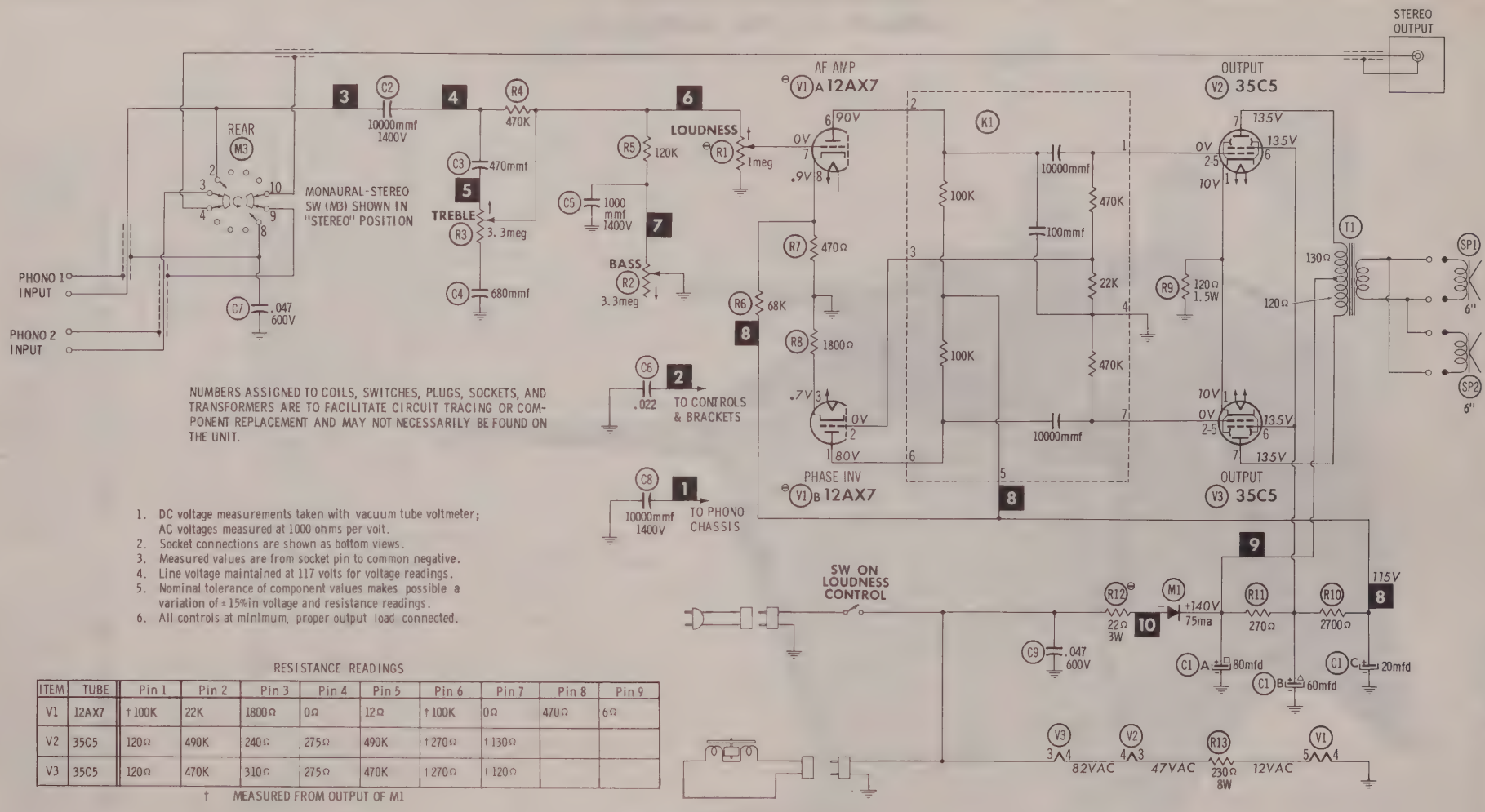
TRADE NAME	Westinghouse Models H46AC1, H46AC2, H46AC3 (Ch. V-2503-3)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.
TYPE SET	AC Operated 3 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105-120 Volts AC, 60 Cycles RATING 33 Watts, .35 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #670V004H02 – SEE COLLARO CONQUEST (REVISED) – PHOTOFACT SET 408 FOLDER 6

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

J86



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	† 100K	22K	1800Ω	0Ω	12Ω	† 100K	0Ω	470Ω	6Ω
V2	35C5	120Ω	490K	240Ω	275Ω	490K	† 270Ω	† 130Ω		
V3	35C5	120Ω	470K	310Ω	275Ω	470K	† 270Ω	† 120Ω		

† MEASURED FROM OUTPUT OF M1

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE™

© Howard W. Sams & Co., Inc. 1959

WESTINGHOUSE MODELS H-46AC1, 2, 3 (Ch. V-2503-3)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inv.	12AX7	7025 *
V2	Output	35C5	
V3	Output	35C5	

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■80	150	218V025H17		BBRT84215	PWP311.75	TDLT-7	PCLS-3444.8*	
B	▲60	150							
C	20	150							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10000	1400		215V201A03			HVE16S1	2HV-110	20HKB-S1	
C3	470			R2CC61Y5Y471M	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C4	680			215V106A81	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68	
C5	1000	1400		215V101A02	DAC-2	DD16-102	HVB16D1	2HV-210	20GA-D1	
C6	.022	400		210V062A23	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C7	.047	600		210V064A73	P488N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C8	10000	1400		215V201A03			HVE16S1	2HV-110	20HKB-S1	
C9	.047	600		210V214A73	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	270V027H08					Loudness Note 1
B	Switch							
R2	3.3meg	½	270V052H02					Bass
R3	3.3meg	½	270V027H07					Treble

Note 1. Some versions may use Part #270V027H13 in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R4	470K		RC20AE474K	
R5	120K		RC20AE124K	
R6	68K		RC20AE683K	
R7	470Ω		RC20AE471K	
R8	1800Ω		RC20AE182K	

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R9	120Ω	1.5	251V023H19	
R10	2700Ω		RC20AE272K	
R11	270Ω		RC20AE271K	
R12	22Ω	3		Note 1
R13	230Ω	8	251V020H17	

Note 1. Some versions may use 33Ω 3W in this application (Part #251V023H22).

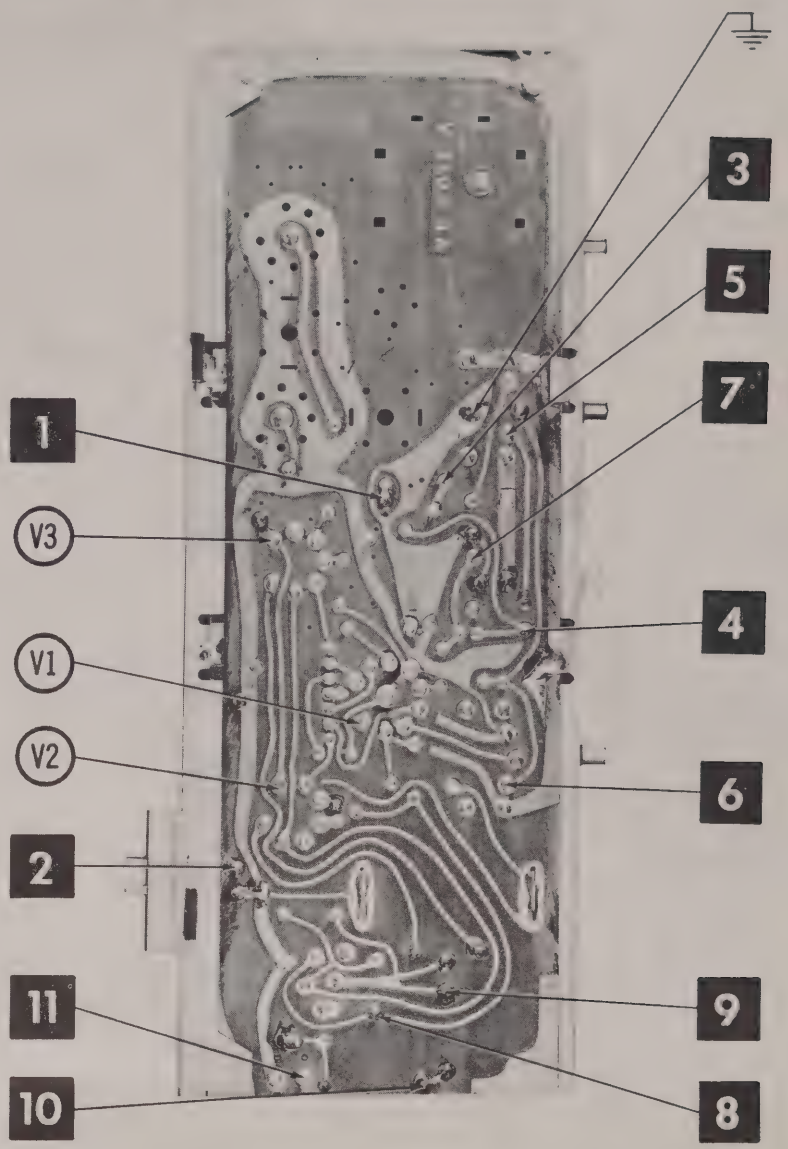
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K1	Audio Couplate	100mmf, 10000mmf, 10000mmf, 22K, 470K, 470K, 100K, 100K	219V024H02	

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4100Ω CT	15Ω Tap ⓐ 8Ω	430V058H01	24S61 ①	A-2901①	AU-600①	A-3823①	24S61①	S-53X①	① Use original channel frame

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Westinghouse PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6"	PM	12-14Ω	570V057H01 ①	6A21Z12.2①	① Parallel And Phase
SP2	6"	PM	12-14Ω	570V057H01 ①	6A21Z12.2①	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA Westinghouse PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.076A	295V012H02 ①	1235AH① HA154 ②	T100 ① SD-94②	150T① K200②		① Selenium Type ② Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA Westinghouse PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M2	671V001H02 *	13-T *				* Includes needle

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M3	Switch	756V036H01	Monaural-Stereo (Rotary Wafer Type)

CABINETS & CABINET PARTS

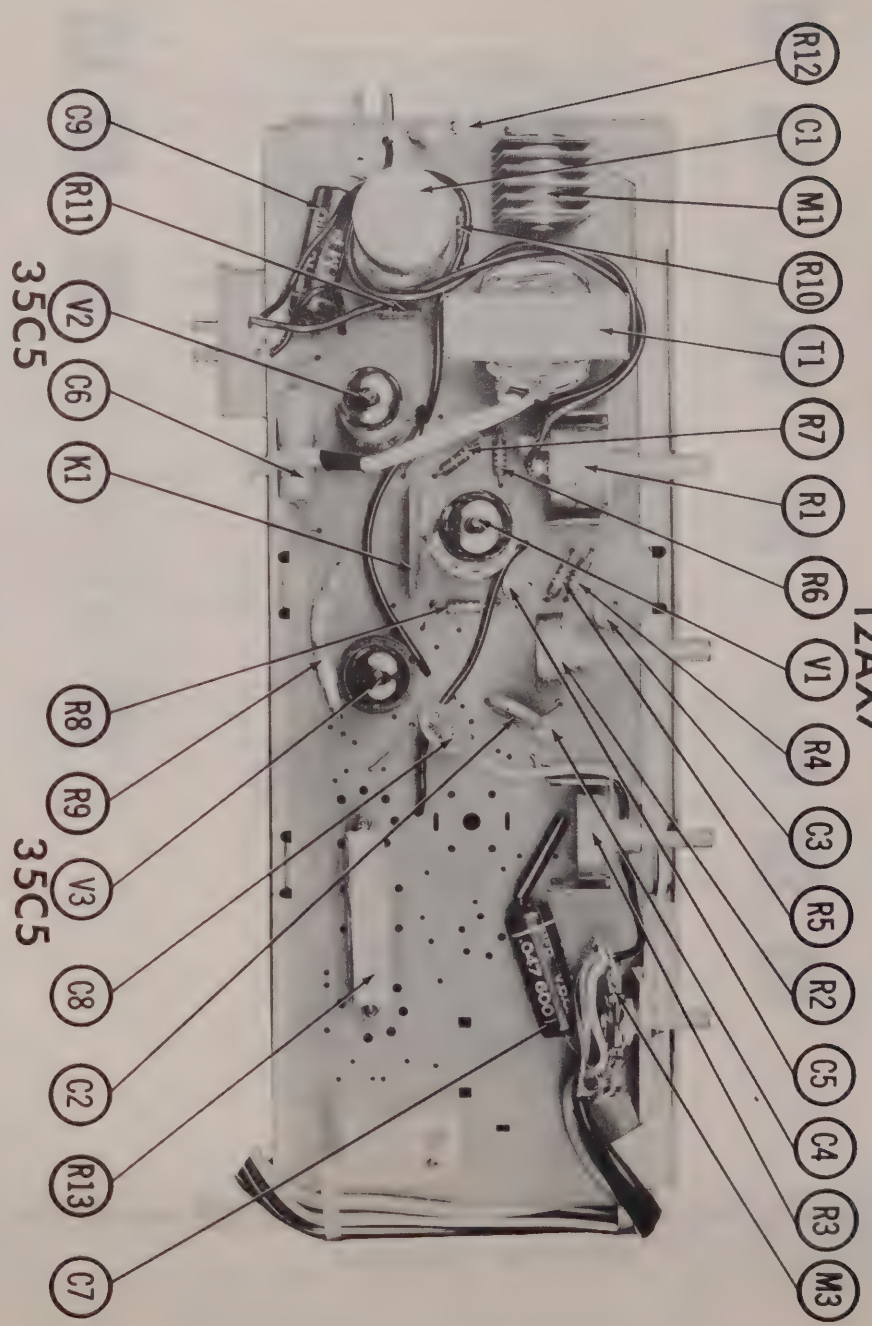
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	550V084H01	Loudness On-Off, Bass, Treble
Knob	550V084H04	Stereo-Monaural
Cabinet	516V072H04	Mahogany, Model H46AC1
Cabinet	516V072H05	Oak, Model H46AC2
Cabinet	516V072H06	Cherry, Model H46AC3
Legs	518V001H13	Mahogany, Model H46AC1
Legs	518V001H15	Oak, Model H46AC2
Legs	518V001H14	Cherry, Model H46AC3

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—TOP VIEW



PHOTOFACT* Folder

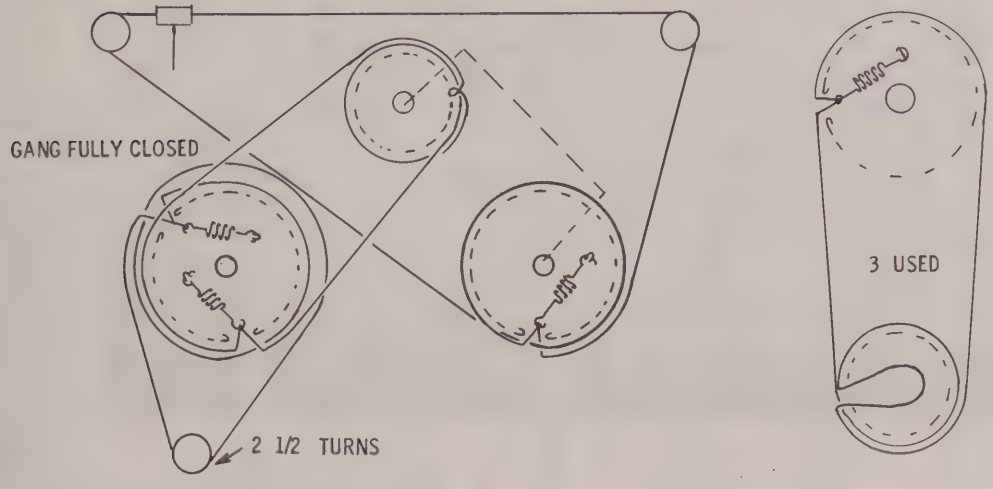
ZENITH MODELS SF2560, E, R, SF2565M, SF2570, Y, SF2575R, SF2580H (Ch. 7B31, 8B24, 9B25)

ZENITH MODELS SF2560, E, R, SF2565M, SF2570, Y, SF2575R, SF2580H (Ch. 7B31, 8B24, 9B25)

TRADE NAME	Zenith Models SF2560, R, E; SF2565M (Ch. 8B24, 7B31); SF2570, Y; SF2575R, SF2580H (Ch. 9B25, 7B31)		
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois		
TYPE SET	AC Operated 15 Tube FM-AM Tuner and Amplifier with 4 Speed Automatic Record Changer		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	175 Watts, 1.6 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 540 - 1620KC	FREQ. MOD.	88 - 108MC

MODELS SF2560, SF2565 USE RECORD CHANGER S-14090 OR S-14093
MODELS SF2570, SF2575, SF2580 USE RECORD CHANGER S-14088
FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR ZENITH S-14086 - PHOTOFACT SET 402 FOLDER 15

DRIVE CORD STRINGING

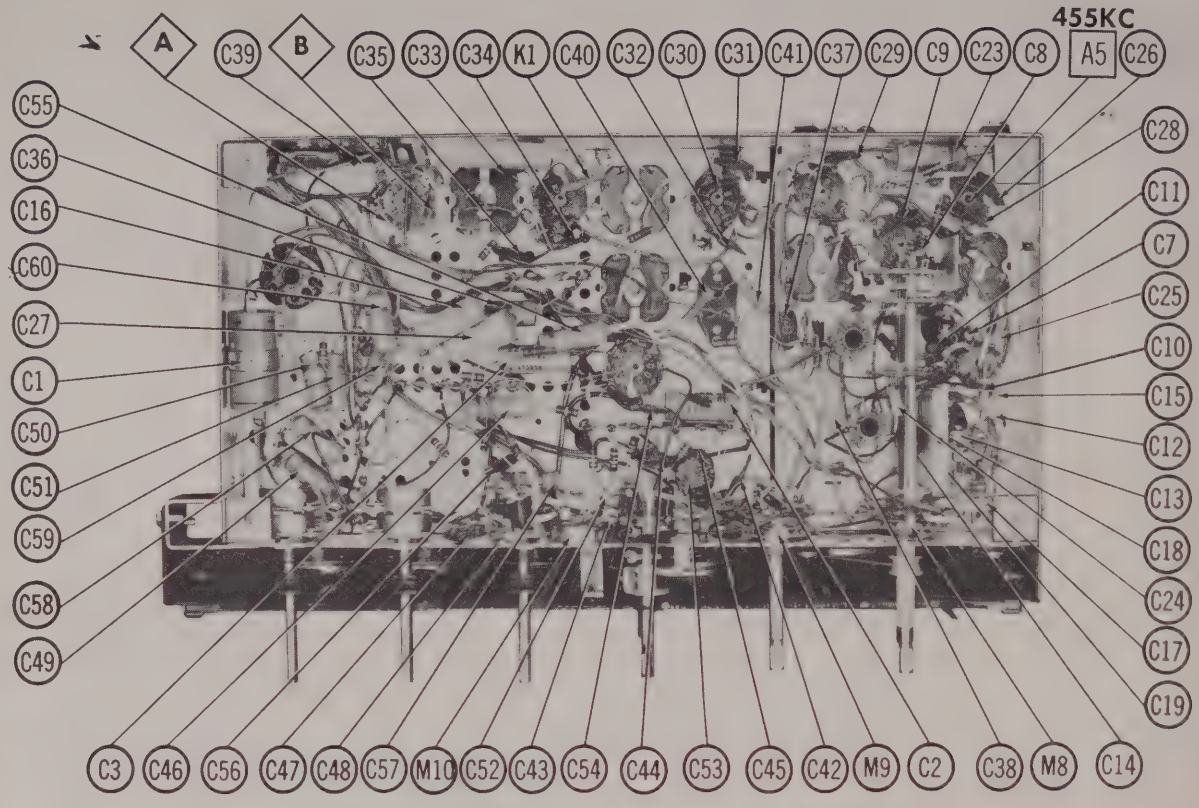


HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

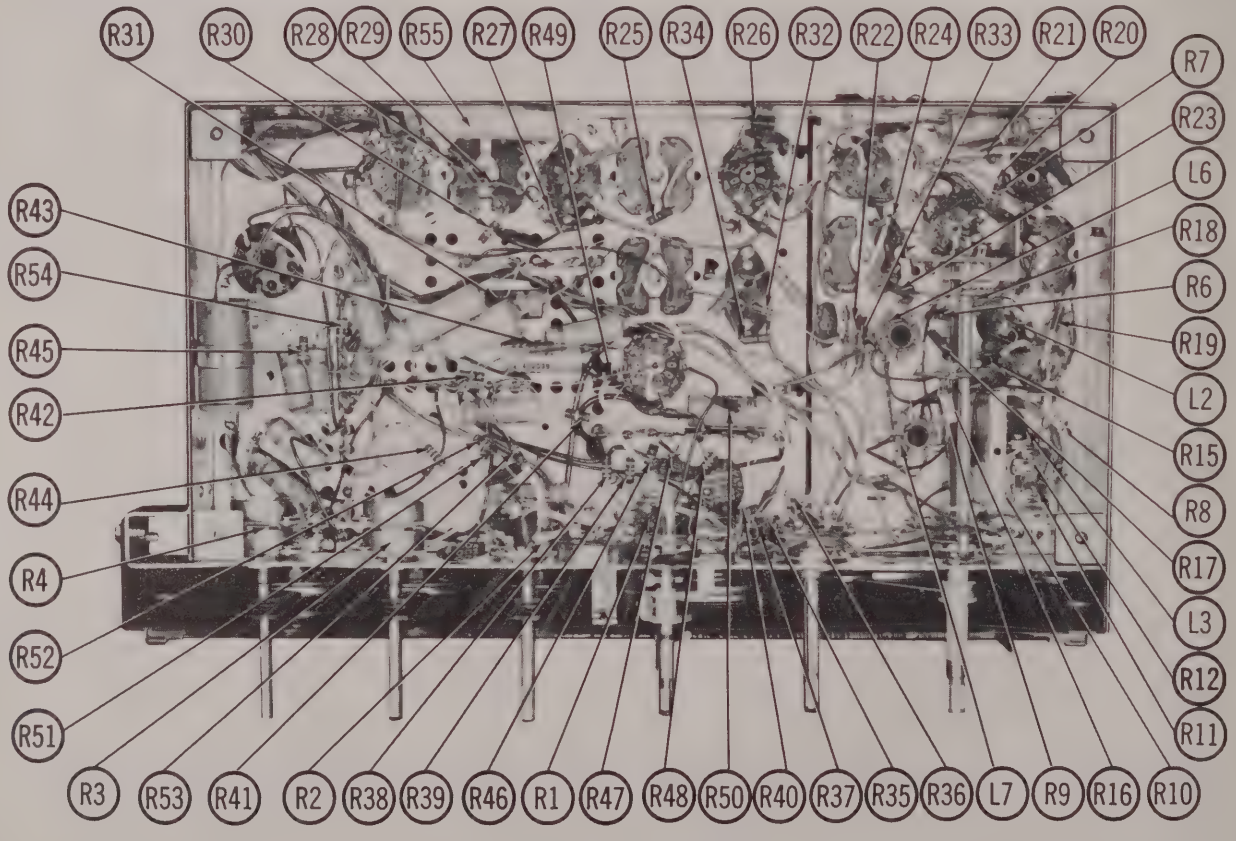
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

H998

SET 453 FOLDER 15



TUNER CHASSIS BOTTOM VIEW — CAPACITOR, MISC. & ALIGN. IDENT.



TUNER CHASSIS BOTTOM VIEW — RESISTOR & INDUCTOR IDENT.

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM-AM RF Amplifier	6BJ6	
V2	FM Osc. - AFC	12AT7	
V3	FM-AM Mixer - AM Osc.	12AT7	
V4	1st FM-AM IF Amplifier	6BA6	
V5	2nd FM-AM IF Amplifier	6BA6	
V6	FM Limiter	6AU6A	
V7	Disc. - AM Det. - AVC	6BC7	
V8	AF Amplifier	ECC83/12AX7	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	350	22-2740	PRS350V10	BR1045	TC62	TD-10-450	TVA-1604	
C2	10	25	22-3076	PRS25V10	BBR10-25	TC22	TD-10-25	TVA-1204	
C3	10	25	22-3076	PRS25V10	BBR10-25	TC22	TD-10-25	TVA-1204	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	7.5			22-1852						
C5	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C6	56		N750 10%	22-2927		TCN-56	C10Q56U	CN7-456	5TCCU-Q56S 10%*	
C7	100			22-5	SI 100	D6-101	LT6T1	UC-531	5GA-T1	
C8	1000			22-1676	SI 1000	D6-102	LT6D1	UC-521	5HK-D1	
C9	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	1000			22-17	EF-001	MFT-1000			503C-D1	
C11	22		5%	22-1506		TCZ-22	LT6Q22	CNO-422	5GA-Q22S 5% *	
C12	50			22-1367	SI 50	D6-500	LT6Q5	UC-545	5GA-Q5	
C13	19		5%	22-2630					5GA-Q19S 5% *	
C14	1000			22-17	EF-001	MFT-1000			503C-D1	
C15	.82									①
C16	.1	200		22-2780	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C17	1000			22-17	EF-001	MFT-1000			503C-D1	
C18	100			22-5	BPD-0001	DD-101	L10T1	CNO-310	5GA-T1	
C19	220			22-2321	SI 220	D6-221	LT6T22	UC-5322	5GA-T22	
C20	220		10%	22-2321	SI 220	D6-221		UC-5322	5GA-T22S 10% *	
C21	.047	200		22-2792	P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	
C22	1000			22-17	EF-001	MFT-1000			503C-D1	
C23	.047	200		22-2792	P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	
C24	50			22-1367	SI 50	D6-500	L10Q5	UC-545	5GA-Q5	
C25	1000			22-1676	SI 1000	D6-102	LT6D1	UC-521	5HK-D1	
C26	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C27	.047	600		22-2794	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C28	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C29	4700			22-14	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C30	2200			22-18	BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	
C31	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C32	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C33	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C34	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C35	1000	1000	10%	22-17				JL-210	5HK-D1S 10% *	
C36	.047	200		22-2792	P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	
C37	100			22-5	BPD-0001	DD-101	L10T1	UC-310	5GA-T1	
C38	.047	200		22-2792	P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	
C39	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C40	220		10%	22-2321	DI-220	D6-221		JL-322	5GA-T22S 10% *	
C41	220		10%	22-2321	DI-220	D6-221		JL-322	5GA-T22S 10% *	
C42	2200			22-18	BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	
C43	39		10%	22-3042	NPO-SI 39	D6-390		CNO-439	5GA-Q39S 10% *	
C44	4700		10%	22-14	DI-4700			JL-247	5HK-D47S 10% *	
C45	4700		10%	22-14	DI-4700			JL-247	5HK-D47S 10% *	
C46	.01	200			P288N-01	DD-103	CUB2S1	GEM-211	2TM-S1	
C47	1000		10%	22-1676	DI-1000			JL-210	5HK-D1S 10% *	
C48	.0047	200	10%	22-2825					2WF-D47	
C49	.0047	200	10%	22-2825					2WF-D47	
C50	.0047	200	10%	22-2825					2WF-D47	
C51	.0047	200	10%	22-2825					2WF-D47	
C52	39		10%	22-3042	NPO-SI 39	D6-390		CNO-439	5GA-Q39S 10% *	

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C53	4700		10%	22-14	DI-4700			JL-247	5HK-D47S 10% *	
C54	4700		10%	22-14	DI-4700			JL-247	5HK-D47S 10% *	
C55	.01	200	10%						2WF-S1	
C56	1000	1000	10%	22-17				JL-210	5HK-D1S 10% *	
C57	.0047	200	10%	22-2825					2WF-D47	
C58	.0047	200	10%	22-2825					2WF-D47	
C59	.0047	200	10%	22-2825					2WF-D47	
C60	.0047	200	10%	22-2825					2WF-D47	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use .68mmf in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	63-4383				♦ UE3958	Loudness, Tap ⓐ 500K, 1meg
B	2meg	½						Stereo Balance, Tap ⓐ 500K, 1meg
R2A	1meg	½	63-4409	BT-107	AD47-1meg-Z	Q13-137		Bass (Left Channel)
B	1meg	½		Not Req.	Not Req.	M13-137	* UE3913	Bass (Right Channel)
C	Shaft			Not Req.	FS-3	Not Req.		
R3A	10K	½	63-4411			Q11-116		Presence (Right Channel)
B	10K	½				M11-116	■ UE3914	Presence (Left Channel)
C	Shaft					Not Req.		
R4A	500K	½	63-4410	BB-104	AD47-500K-Z	Q13-133		Treble (Left Channel)
B	500K	½		Not Req.	Not Req.	M13-133	† UE3915	Treble (Right Channel)
C	Shaft			Not Req.	FS-3	Not Req.		

♦ "STA-LOC" Equivalent: FC26DT16, RU26DT125, OS1750, IK2312.
* "STA-LOC" Equivalent: FA16A, RI16A, CS3500.
■ "STA-LOC" Equivalent: FA14L, RU14L, CS3500.
† "STA-LOC" Equivalent: FA55A, RU55A, CS3500.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R5	2.2meg		63-1926	
R6	470Ω		63-1771	
R7	680Ω		63-1779	
R8	10K		63-1827	
R9	1000Ω		63-1786	
R10	47Ω		63-1730	
R11	100K		63-1869	
R12	1800Ω		63-1796	
R13	1meg		63-1912	
R14	33Ω		63-1723	
R15	220Ω		63-1757	
R16	10K		63-1827	
R17	1000Ω		63-1785	
R18	220Ω		63-1757	
R19	2200Ω		63-1800	
R20	4.7meg		63-1940	
R21	4.7meg		63-1940	
R22	2.2meg		63-1926	
R23	220Ω		63-1757	
R24	100K		63-1869	
R25	220Ω		63-1757	
R26	100Ω		63-1744	
R27	15K		63-1835	
R28	150K		63-1876	
R29	150K		63-1876	
R30	100K		63-1869	

ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R31	2.2meg		63-1926	
R32	47K		63-1856	
R33	220K		63-1883	
R34	1meg		63-1912	
R35	1.5meg		63-1919	
R36	220K		63-1883	
R37	680K		63-1904	
R38	18K		63-1838	
R39	330K		63-1890	
R40	68K		63-1862	
R41	100K		63-1869	
R42	10K		63-1827	
R43	1000Ω		63-1786	
R44	330K		63-1890	
R45	470Ω		63-1771	
R46	18K		63-1838	
R47	330K		63-1890	
R48	68K		63-1862	
R49	100K		63-1869	
R50	10000Ω		63-1785	
R51	330K		63-1890	
R52	100K		63-1869	
R53	100K		63-1869	
R54	470Ω		63-1771	
R55	2000Ω	10	63-4414	

TUNER PARTS LIST AND DESCRIPTIONS (cont)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K1	Limiter Grid	25mmf, 100K	105-42	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		ZENITH PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	20-355					
L2	FM RF Coil	S-15743					
L3	FM Osc. Coil	S-15691					
L4	Loop Antenna	S-17325					Insulated Wire Stapled to Cabinet
L5	AM Ant. Coil	S-18812	19-4201	TV-197	6154		
L6	AM RF Coil	S-41088					
L7	AM Osc. Coil	S-41087					
L8	1st FM IF Trans.	95-1150	16-3487 *	FM-251 ▲	1451 ▲		
L9	1st AM IF Trans.	95-1549					
L10A	2nd FM IF Trans.	95-1251					
B	2nd AM IF Trans.						
L11	3rd FM IF Trans.	95-1150	16-3487 *	FM-251 ▲	1451 ▲		
L12	3rd AM IF Trans	95-1102	16-6770 ♦	BC-355 ♦	12-C6 ♦		
L13	Discriminator	95-1153					

* Use adapter plate. ▲ Enlarge mounting holes. ♦ Remove center bolt mounting plate and use adapter plate.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	ZENITH PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	142-93 ①	13-TB ①				① Includes needles

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ZENITH PART No.	JENSEN PART No.	WALCO PART No.	
M2	(78RPM)	† E-98 or ♦ E-98D		† Jewel ♦ Diamond
	(LP)	† E-98X or ♦ E-98XD		

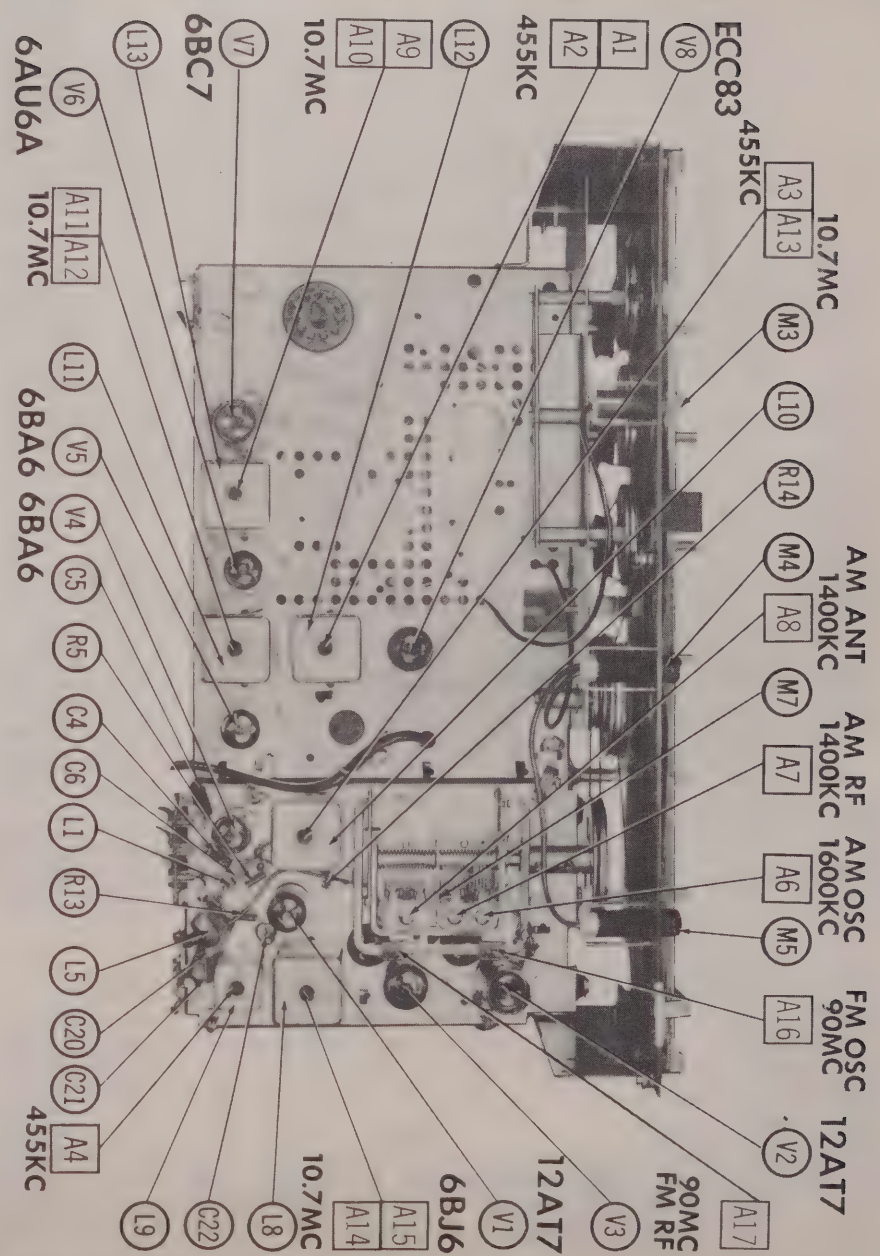
MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Lamp	100-221	#45
M4	Lamp	100-221	#45
M5	Lamp	100-221	#45
M6	Lamp	100-221	#45
M7	Tuning Cap.	22-2944	AM, 3 Gang (Ant. 24-380mmf, RF 13-206mmf, Osc. 18-90mmf)
M8	Switch	85-616	Function Selector (4 Position, Rotary Wafer Type)
M9	Switch	85-611	Compensator, (6 Position, Rotary Wafer Type)
M10	Switch	85-613	Power On-Off, (SPST, Snap Type)
	Dial Pointer	59-341	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUNER CHASSIS—TOP VIEW



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: A1 thru A5, A9 thru A15..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A6, A7, A8.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05mfd	High side to pin 7 (grid) of 12AT7 (V3). Low side to chassis.	455KC (400∿ Mod.)	AM	Point of non-interference	Across speaker terminals	A1, A2, A3, A4, A5	Adjust for maximum output.
2.	"	High side to AM antenna terminal. Low side to chassis.	1600KC	"	1600KC	"	A6	"
3.	"	"	1400KC	"	Tune to 1400KC signal	"	A7, A8	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.05mfd	High side to pin 1 (grid) of 6AU6 (V6). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe thru 1meg to point (A). Common to chassis.	A9	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (B). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
6.	"	High side to pin 7 (grid) of 12AT7 (V3). Low side to chassis.	"	"	"	DC probe thru 1meg to pin 1 (grid) of 6AU6(V6) Common to chassis.	A11, A12, A13, A14, A15	Adjust for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.05mfd	High side to pin 1 (grid) of 6AU6 (V6). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. thru 27K to point (A). Low side to chassis.	A9	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A10	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.
6.	"	High side to pin 7 (grid) of 12AT7 (V3). Low side to chassis.	"	"	"	Vert. Amp. thru 27K to pin 1 (grid) of 6AU6 (V6). Low side to chassis.	A11, A12, A13, A14, A15	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.

FM RF ALIGNMENT

Apply hot iron to melt cement, so slugs can be adjusted.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
7.	270Ω Carbon Resistor	High side to FM antenna terminal. Low side to chassis.	90MC (Unmod.)	FM	98MC	DC probe thru 1meg to pin 1 (grid) of 6AU6 (V6). Common to chassis.	A16, A17	Adjust for maximum deflection. Secure shafts with cement.

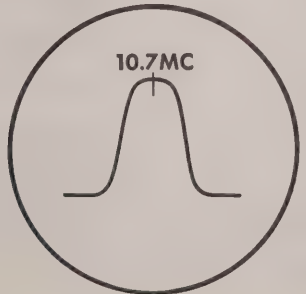


FIG. 1

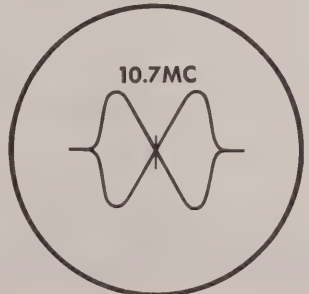
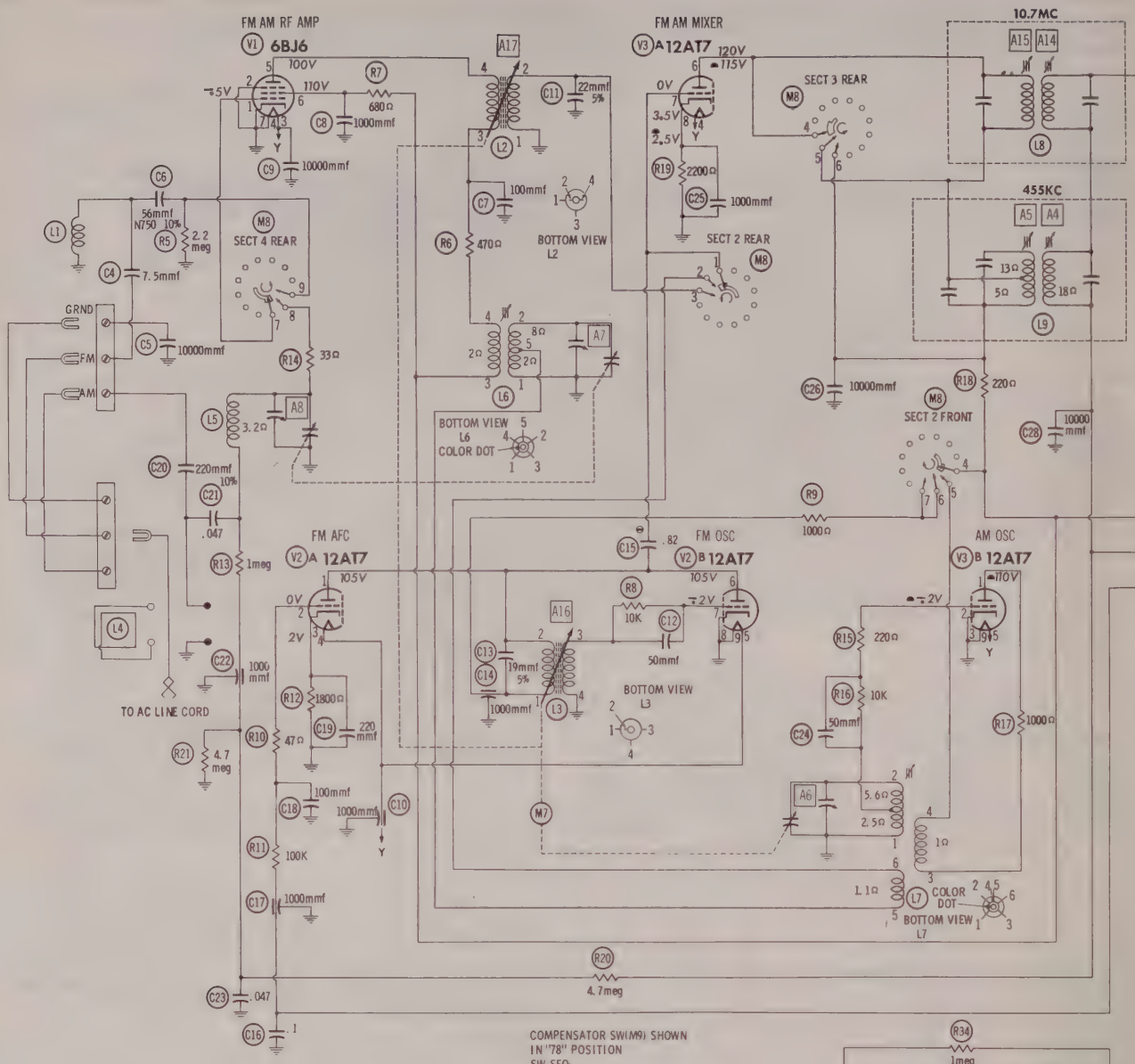
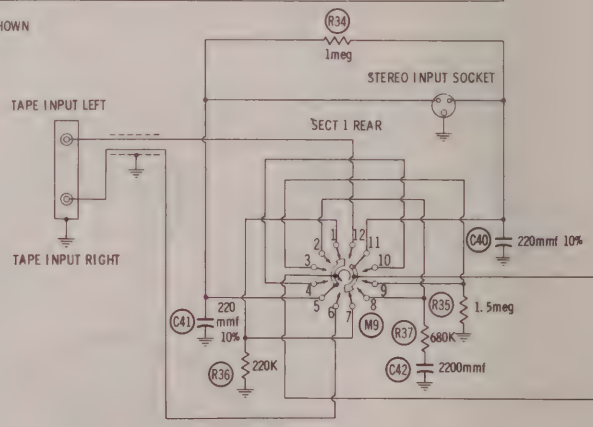


FIG. 2



COMPENSATOR SW(M9) SHOWN IN "78" POSITION
SW SEQ:
1. 78
2. FORN.
3. LP
4. RIAA
5. STEREO
6. TAPE



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BJ6	2.2meg ▲4.2meg	0Ω	.1Ω	0Ω	†3800Ω	†4000Ω	0Ω		
V2	12AT7	†4400Ω	■2.6meg 100K	1800Ω	.1Ω	.1Ω	†4400Ω	10K	0Ω	0Ω
V3	12AT7	†▲4400Ω	▲10K	0Ω	.1Ω	.1Ω	†3600Ω	INF ▲4Ω	2200Ω	0Ω
V4	6BA6	2meg	0Ω	.1Ω	0Ω	†3600Ω	†3600Ω	0Ω		
V5	6BA6	100K	0Ω	.1Ω	0Ω	†3600Ω	†3600Ω	100Ω		
V6	6AU6A	100K	0Ω	.1Ω	0Ω	†18K	†18K	0Ω		
V7	6BC7	0Ω	150K	TP	.1Ω	0Ω	260K	0Ω	150K	300K
V8	ECC83 12AX7	†110K	0Ω	1000Ω	.1Ω	.1Ω	†110K	0Ω	1000Ω	.1Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
▲ MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 8 OF V15. (REFER TO AMP SCHEMATIC, PAGE 9)
■ MEASURED IN "FM-AFC" POSITION.

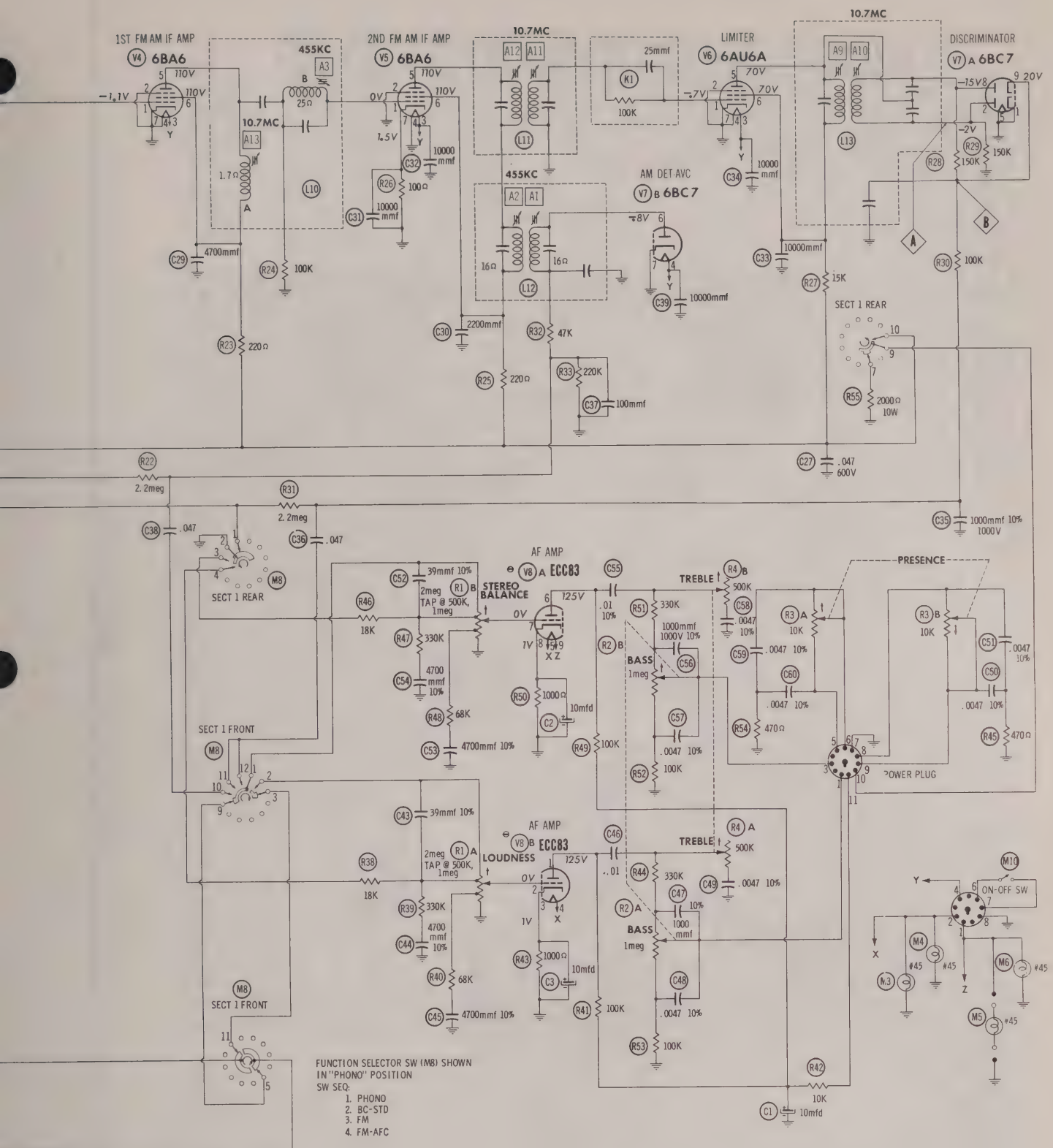
Ⓔ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

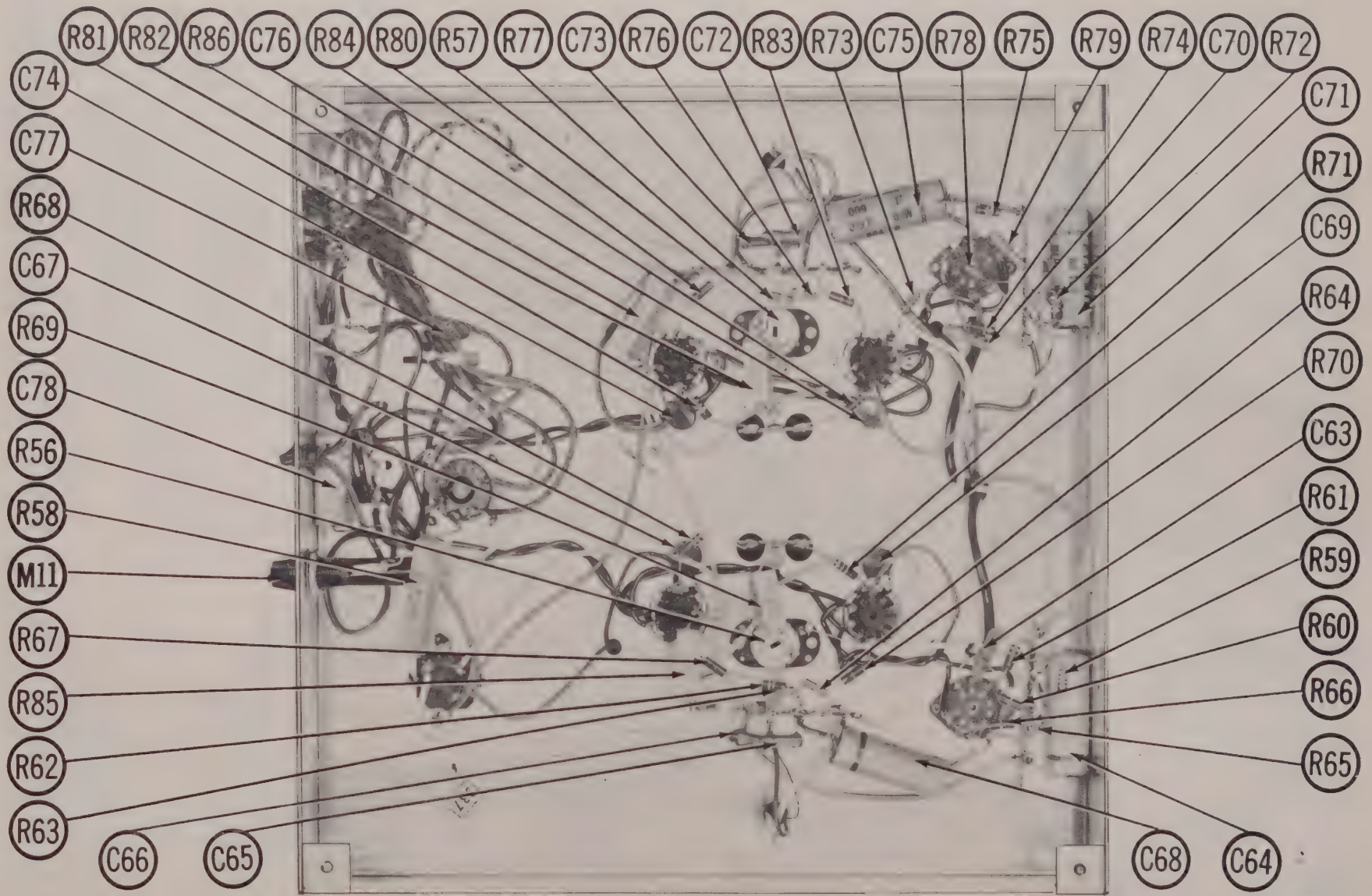
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1959

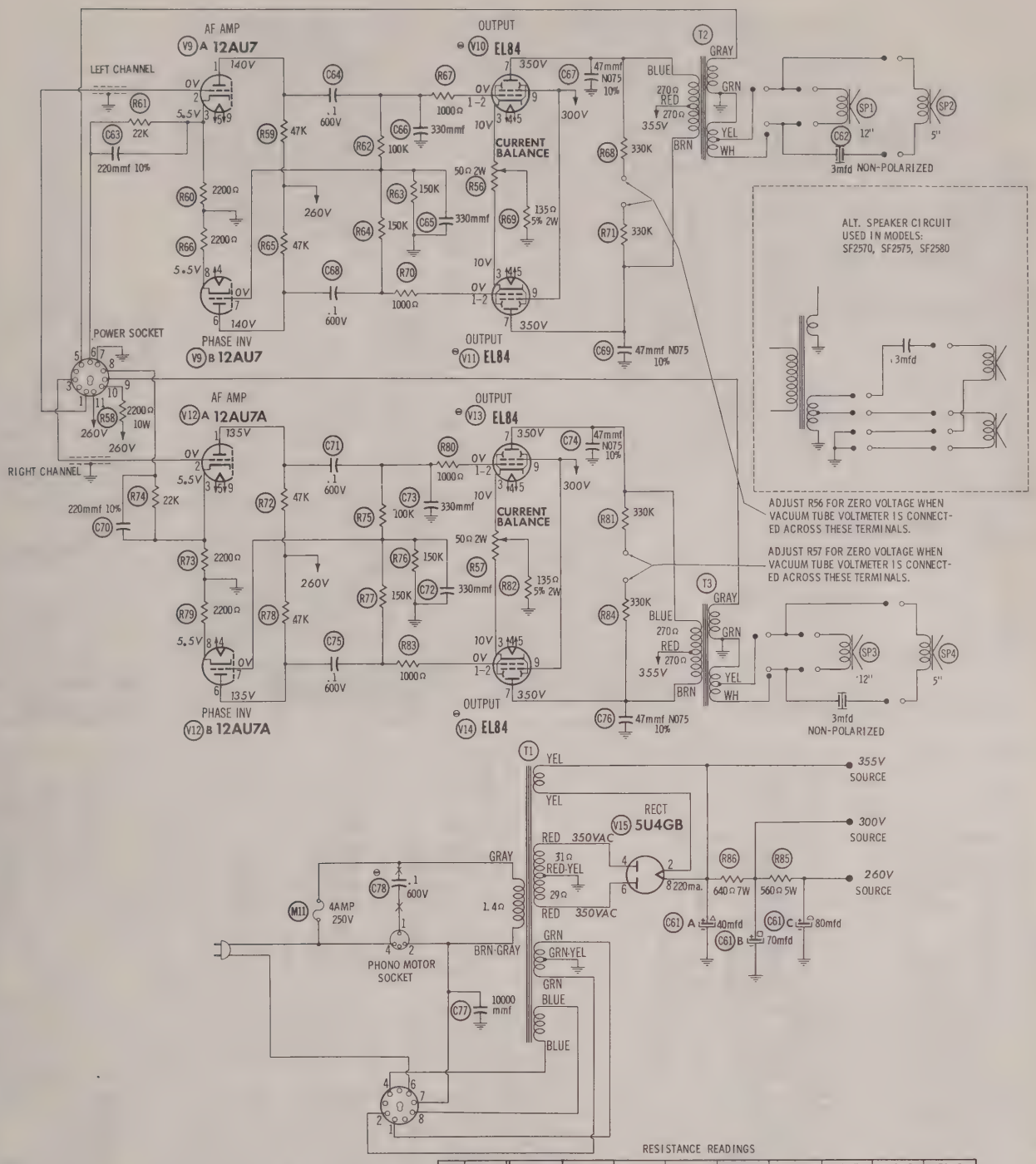


FUNCTION SELECTOR SW (M8) SHOWN IN "PHONO" POSITION
SW SEQ:
1. PHONO
2. BC-STD
3. FM
4. FM-AFC

ZENITH MODELS SF2560, E, R, SF2565M, SF2570, Y, SF2575R, SF2580H (Ch. 7B31, 8B24, 9B25)



AMP CHASSIS — BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V9	12AU7	†48K	100K	2200Ω	.1Ω	.1Ω	†48K	150K	2200Ω	.1Ω
V10	EL84 6BQ5	250K	250K	160Ω	.1Ω	.1Ω	NC	†270Ω	NC	†640Ω
V11	EL84 6BQ5	300K	300K	160Ω	.1Ω	.1Ω	NC	†270Ω	NC	†640Ω
V12	12AU7A	†48K	100K	2200Ω	.1Ω	.1Ω	†48K	150K	2200Ω	.1Ω
V13	EL84 6BQ5	250K	250K	160Ω	.1Ω	.1Ω	NC	†270Ω	NC	†640Ω
V14	EL84 6BQ5	300K	300K	160Ω	.1Ω	.1Ω	NC	†270Ω	NC	†640Ω
V15	5U4GB	NC	¶	NC	31Ω	NC	29Ω	TP	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V15.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1959

ZENITH MODELS SF2560, E, R, SF2565M, SF2570, Y, SF2575R, SF2580H (Ch. 7B31, 8B24, 9B25)

AMP SCHEMATIC

AMP PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V9	Left Channel AF Amplifier-Phase Inverter	12AU7	
V10	Left Channel Output	EL84/6BQ5	
V11	Left Channel Output	EL84/6BQ5	

ITEM No.	USE	TYPE	NOTES
V12	Right Channel AF Amp. - Phase Inverter	12AU7A	
V13	Right Channel Output	EL84/6BQ5	
V14	Right Channel Output	EL84/6BQ5	
V15	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C61A	▲40	450	22-3099	AFH4-94-90	B0480	FP264.5	TMT-58	TVLS-3793.5*	
B	■70	450			BR8045	TC80	TD-80-450		
C	▬80	450							
C62	3	30NP	22-2945	NP-PRS50V4	BBR5-50 † BBR5-50 †	TCN504	TD-5-50 † TD-5-50	TVAS-1215 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Connect negative leads together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C63	220		10%	22-2321	NPO-SI 220	D6-221	LT6T22	JL-322	5GA-T22S 10% *	
C64	.1	600		22-2782	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C65	330			22-2309	SI 330	D6-331	LT6T33	UC-5333	5GA-T33	
C66	330			22-2309	SI 330	D6-331	LT6T33	UC-5333	5GA-T33	
C67	47		N075 10%	22-2376						
C68	.1	600		22-2782	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C69	47		N075 10%	22-2376						
C70	220		10%	22-2321	NPO-SI 220	D6-221		JL-322	5GA-T22S 10% *	
C71	.1	600		22-2782	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C72	330			22-2309	SI 330	D6-331	LT6T33	UC-5333	5GA-T33	
C73	330			22-2309	SI 330	D6-331	LT6T33	UC-5333	5GA-T33	
C74	47		N075 10%	22-2376						
C75	.1	600		22-2782	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C76	47		N075 10%	22-2376						
C77	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C78	.1	600		22-2782	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	①

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R56	50Ω	2(WW)	63-4402	WN-500	A43-50	WPK50	C50P	Current Balance, Left Chan.
R57	50Ω	2(WW)	63-4402	WN-500	A43-50	WPK50	C50P	Current Balance, Right Chan.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	NOTES
R58	2200Ω	10	63-4395	
R59	47K		63-1856	
R60	2200Ω		63-1800	
R61	22K		63-1841	
R62	100K		63-1869	
R63	150K		63-1876	
R64	150K		63-1876	
R65	47K		63-1856	
R66	2200Ω		63-1800	
R67	1000Ω		63-1785	
R68	330K		63-1890	
R69	135Ω 5%	2	63-4397	
R70	1000Ω		63-1785	
R71	330K		63-1890	
R72	47K		63-1856	

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	NOTES
R73	2200Ω		63-1800	
R74	22K		63-1841	
R75	100K		63-1869	
R76	150K		63-1876	
R77	150K		63-1876	
R78	47K		63-1856	
R79	2200Ω		63-1800	
R80	1000Ω		63-1785	
R81	330K		63-1890	
R82	135Ω 5%	2	63-4397	
R83	1000Ω		63-1785	
R84	330K		63-1890	
R85	560Ω	5	63-4405	
R86	640Ω	7	63-4424	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.6A	700VCT @ .220A	5V @ 3A	95-1638						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VCT @ 4.5A	6.3V @ 2.1A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.1	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5000Ω CT	50Ω SEC.2 16Ω Tap @ 6-8Ω	95-1639							
	PRI.	SEC.1								
T3	5000Ω CT	50Ω SEC. 2 16Ω Tap @ 6-8Ω	95-1639							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	49-873	12A4A	① Models SF2560, R, E; SF2565R, M only
SP2	5"	PM	3-4Ω	49-856 ①	5A1Z3.4	② Models SF2570, SF2575R, SF2580H only
SP3	12"	PM	6-8Ω	49-873	12A4A	
SP4	5"	PM	3-4Ω	49-856 ①	5A1Z3.4	
		PM		49-867 ②		
		PM		49-867 ②		

AMP PARTS LIST AND DESCRIPTIONS (Cont)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M11	3AG	4A 250V	136-31	62-17	312004. (3AG 4A 250V)	342001	MTH4	HKP

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

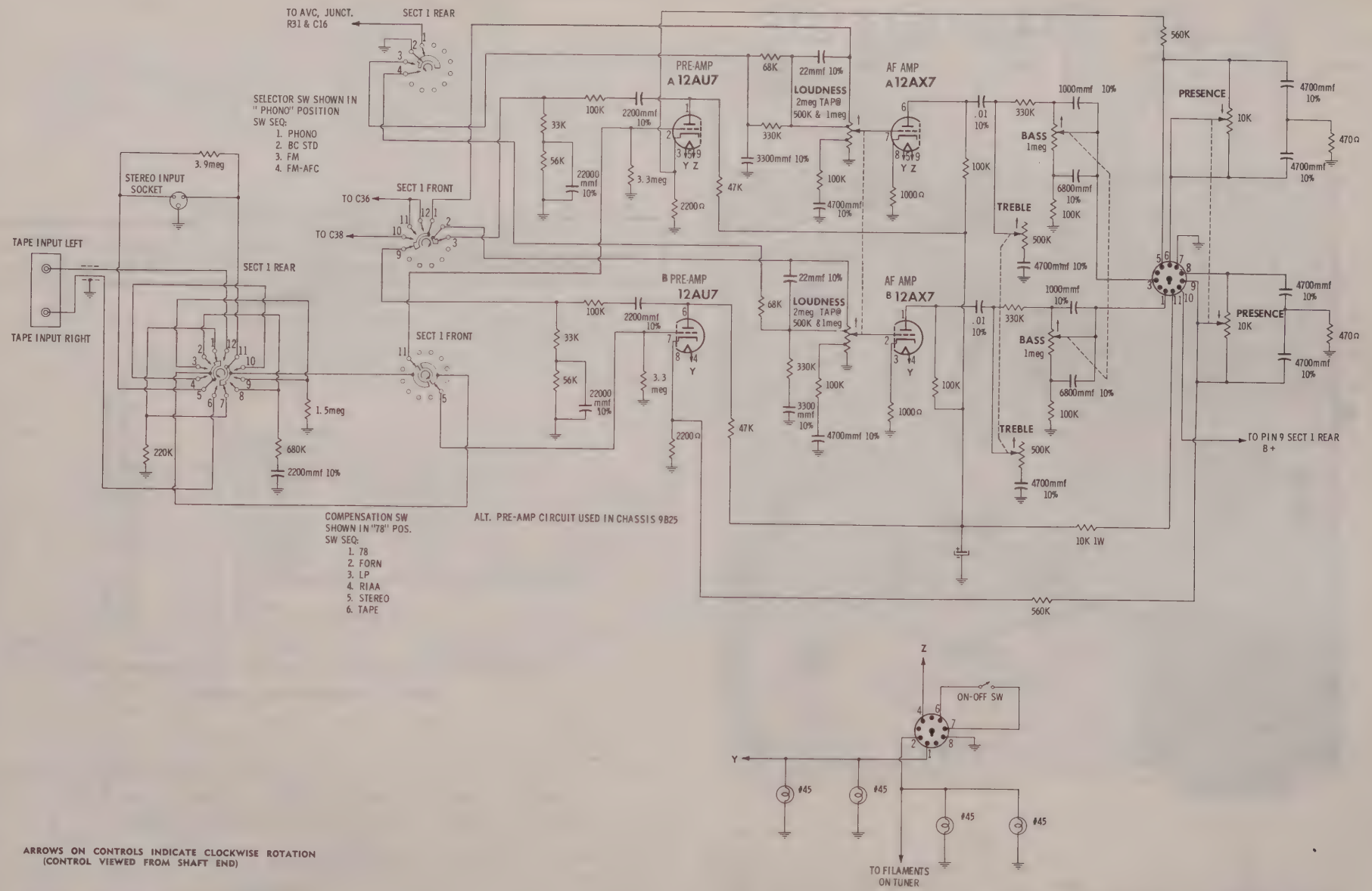
NAME	PART NO.	DESCRIPTION
Knob	S-44166	Tuning, Includes Ring Assembly
Knob	46-1997	Volume
Knob	46-2097	Volume
Knob	S-44167	Presence-Bass-Treble, 3 used, Includes Retaining Spring Assembly
Knob	46-2080	Compensator
Cabinet	14-2497TE	Model SF2560E
Cabinet	14-2497	Model SF2560
Cabinet	14-2522M	Model SF2565M
Cabinet	14-2522R	Model SF2565R
Cabinet	14-2513	Model SF2570
Cabinet	14-2513Y	Model SF2570Y
Cabinet	14-2516H	Model SF2580H
Cabinet	14-2520R	Model SF2575R
Legs	98-194	Model SF2560
Legs	98-195	Model SF2560E
Indicator Dial	26-622	Presence and Tone
Dial Scale	26-614	
Dial Crystal	192-269	FM
Lens	171-19	Indicator Light

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

AMP CHASSIS—TOP VIEW

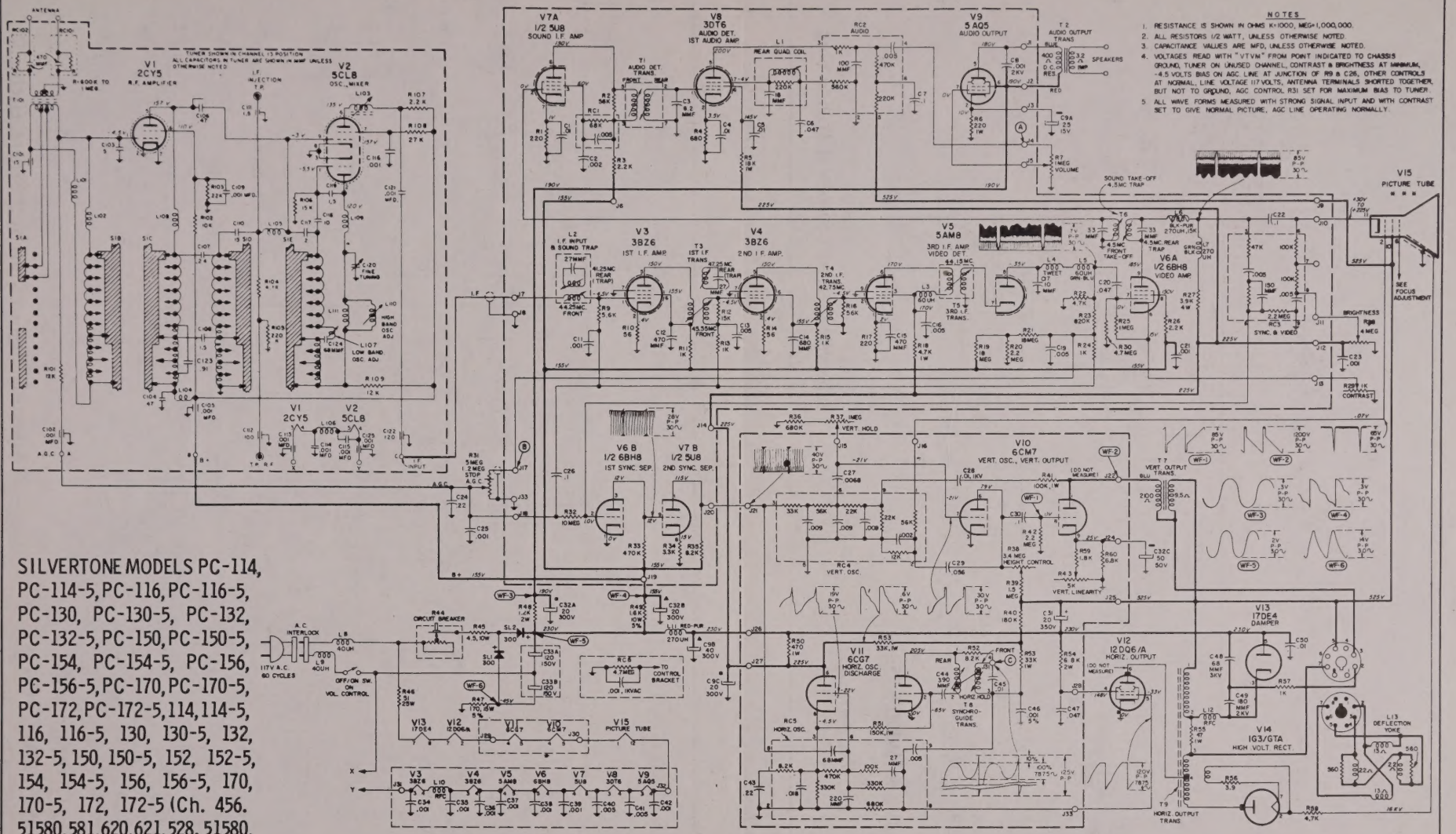


ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION
(CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1959

ZENITH MODELS SF2560, E, R, SF2565M, SF2570, Y, SF2575R, SF2580H (Ch. 7B31, 8B24, 9B25)

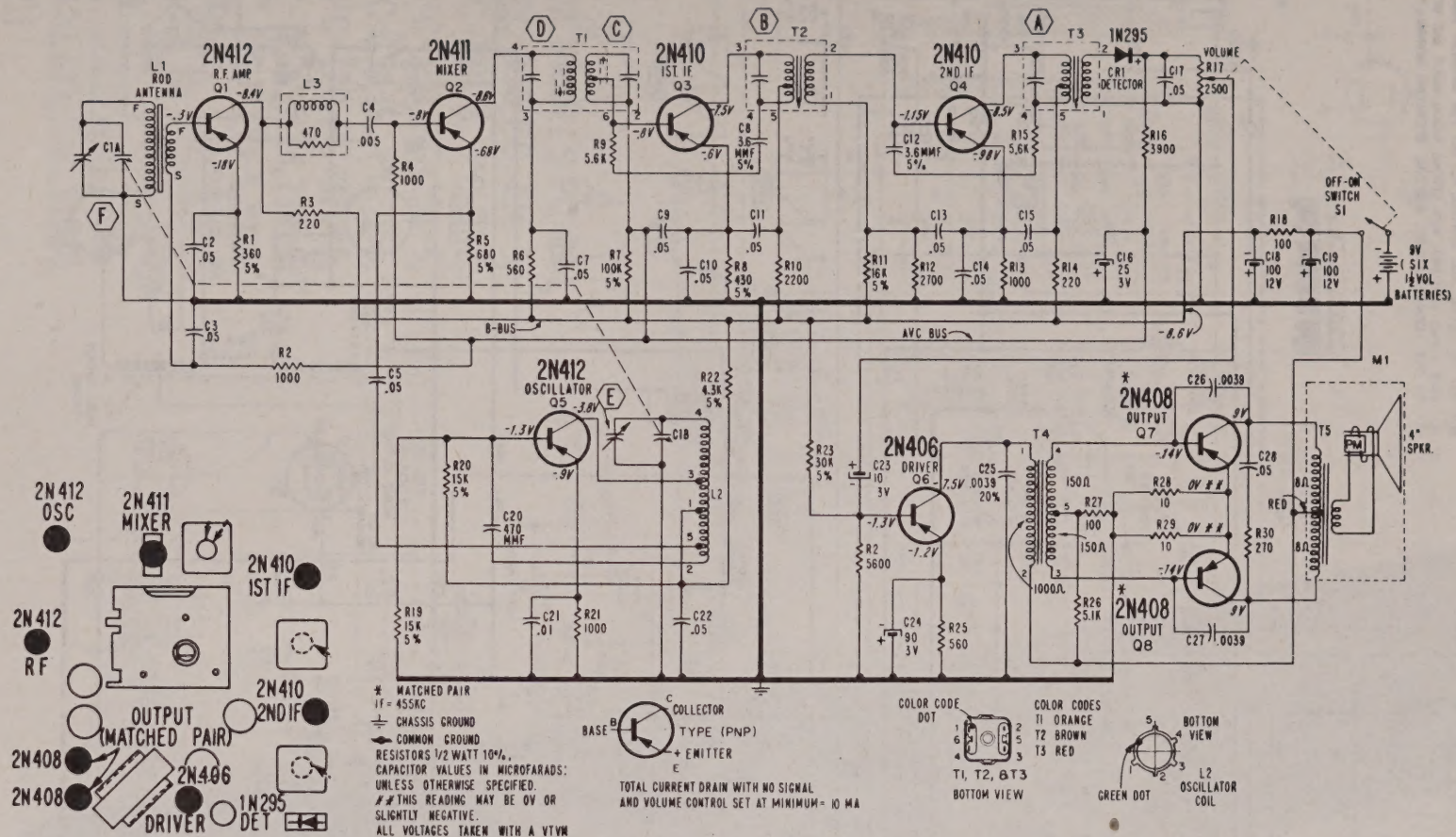
ALTERNATE PREAMP SCHEMATIC — CHASSIS 9B25


NOTES
1. RESISTANCE IS SHOWN IN OHMS K=1000, MEG=1,000,000.
2. ALL RESISTORS 1/2 WATT, UNLESS OTHERWISE NOTED.
3. CAPACITANCE VALUES ARE MFD, UNLESS OTHERWISE NOTED.
4. VOLTAGES READ WITH "VTVM" FROM POINT INDICATED TO CHASSIS GROUND, TUNER ON UNUSED CHANNEL, CONTRAST & BRIGHTNESS AT MAXIMUM, -4.5 VOLTS BIAS ON AGC LINE AT JUNCTION OF R9 & C26, OTHER CONTROLS AT NORMAL, LINE VOLTAGE 117 VOLTS, ANTENNA TERMINALS SHORTED TOGETHER, BUT NOT TO GROUND, AGC CONTROL R31 SET FOR MAXIMUM BIAS TO TUNER.
5. ALL WAVE FORMS MEASURED WITH STRONG SIGNAL INPUT AND WITH CONTRAST SET TO GIVE NORMAL PICTURE, AGC LINE OPERATING NORMALLY.
V1 2CY5 R.F. AMPLIFIER
V2 5CL8 OSC.-MIXER
V3 3BZ6 1ST I.F. AMP.
V4 3BZ6 2ND I.F. AMP.
V5 5AM8 3RD I.F. AMP. VIDEO DET.
V6A 1/2 6BH8 VIDEO AMP.
V6 B 1/2 6BH8 1ST SYNC. SEP.
V7 B 1/2 5U8 2ND SYNC. SEP.
V7A 1/2 5U8 SOUND I.F. AMP.
V8 3DT6 AUDIO DET. 1ST AUDIO AMP.
V9 5AQ5 AUDIO OUTPUT
V10 6CM7 VERT. OSC., VERT. OUTPUT
V11 6CG7 HORIZ. OSC. DISCHARGE
V12 12DQ6/A HORIZ. OUTPUT
V13 17DE4 DAMPER
V14 1G3/GTA HIGH VOLT. RECT.
V15 PICTURE TUBE
ANTENNA
TUNER SHOWN IN CHANNEL 13 POSITION
ALL CAPACITORS IN TUNER ARE SHOWN IN MMF UNLESS OTHERWISE NOTED
I.F. INJECTION T.P.
R-400K TO 1 MEG
HIGH BAND OSC. ADJ.
LOW BAND OSC. ADJ.
FINE TUNING
I.F. INPUT
A.G.C.
B+
T.P. R.F.
27MMF
41.25MC REAR (TRAP)
4.25MC FRONT
47.25MC REAR TRAP
45.75MC FRONT
42.75MC
4.5MC FRONT TAKE-OFF
4.5MC REAR TRAP
SOUND TAKE-OFF 4.5MC TRAP
REAR QUAD. COIL
AUDIO OUTPUT TRANS.
SPEAKERS
VOLUME
BRIGHTNESS
CONTRAST
SYNC. & VIDEO
SEE FOCUS ADJUSTMENT
PICTURE TUBE
VERT. HOLD
VERT. OSC.
VERT. LINEARITY
HEIGHT CONTROL
VERT. OUTPUT TRANS.
HORIZ. OUTPUT TRANS.
HORIZ. OSC.
SYNCHRO-GUIDE TRANS.
DEFLECTION YOKE
A.C. INTERLOCK
117V A.C. 60 CYCLES
OFF-ON SW. ON VOL. CONTROL
CIRCUIT BREAKER
TO CONTROL BRACKET
.001, 1KVAC
DO NOT MEASURE

SILVERTONE MODELS PC-114, PC-114-5, PC-116, PC-116-5, PC-130, PC-130-5, PC-132, PC-132-5, PC-150, PC-150-5, PC-154, PC-154-5, PC-156, PC-156-5, PC-170, PC-170-5, PC-172, PC-172-5, 114, 114-5, 116, 116-5, 130, 130-5, 132, 132-5, 150, 150-5, 152, 152-5, 154, 154-5, 156, 156-5, 170, 170-5, 172, 172-5 (Ch. 456. 51580, 581, 620, 621, 528. 51580, 581, 620, 621)

CAUTION: Discharging or metering of second anode of picture tube must be to main chassis only.

Schematic Diagram Courtesy of Sears, Roebuck & Co.

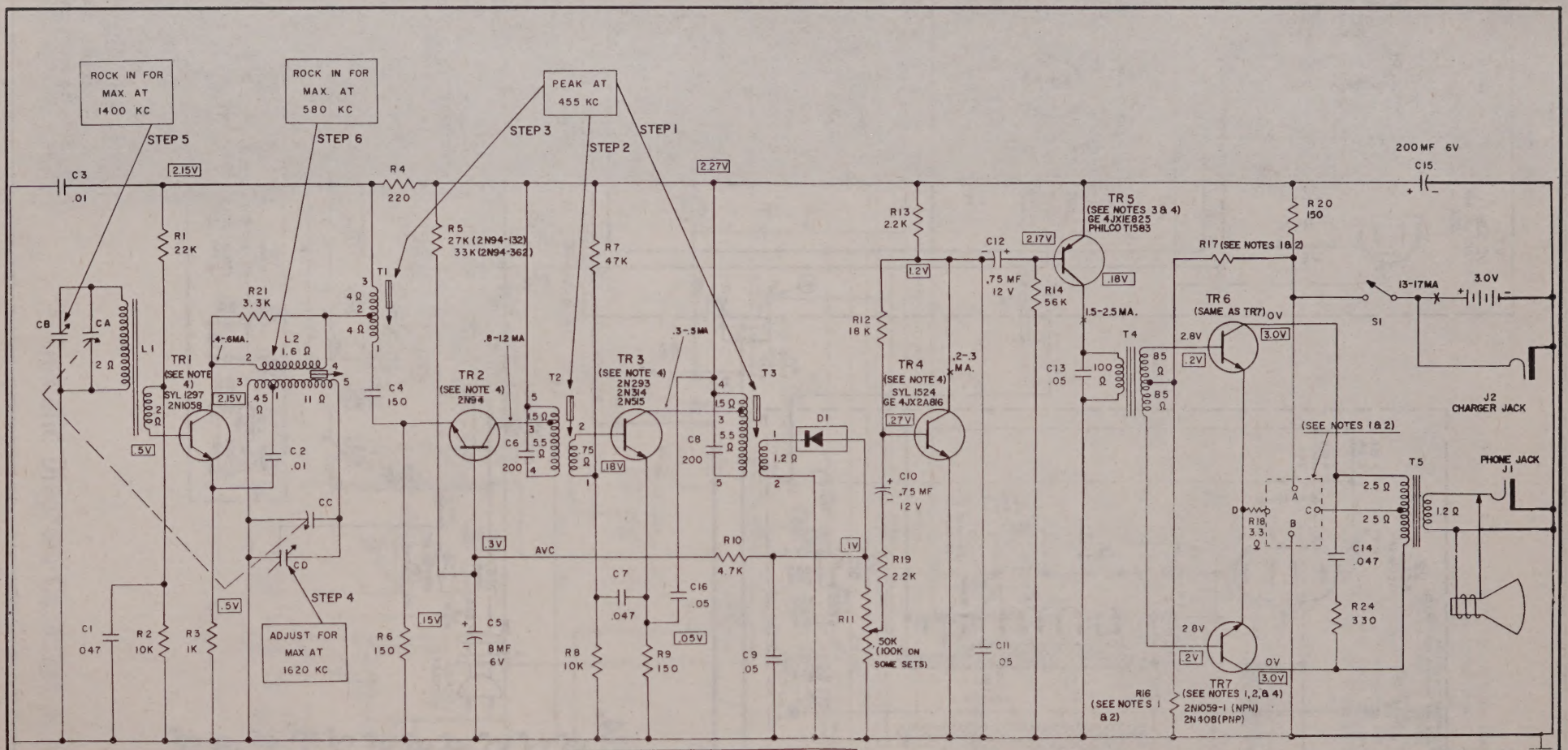


ADMIRAL MODELS 751,

757 (Ch. 8V1)

Schematic Diagram Courtesy of Admiral Corp.

© Howard W. Sams & Co., Inc. 1959



ALIGNMENT

SET VOLUME CONTROL AT MAXIMUM.
CONNECT OUTPUT METER OR SCOPE ACROSS VOICE COIL.
INDUCTIVELY COUPLE SIGNAL GENERATOR TO RECEIVER
STEP 1, 2 & 3 - SET SIG. GEN. AT 455 KC, WITH RECEIVER TUNING GANG OPEN.
STEP 4 - SET SIG. GEN. AT 1620 KC, WITH RECEIVER TUNING GANG OPEN
STEP 5 - SET SIG. GEN. AT 1400 KC, TUNE RECEIVER TO 1400 KC.
STEP - SET SIG. GEN. AT 580 KC, TUNE RECEIVER TO 580 KC.

NOTES—

1. FOR NPN TR6 AND TR7
   A. CONNECT A JUMPER WIRE BETWEEN POINTS A & C } SEE PHANTOM WIRING DIAGRAM
   B. R18 MUST BE SOLDERED IN CIRCUIT BETWEEN B & D }
   C. R16 MUST BE 100Ω THERMISTOR.
   D. R17 MUST BE 1500Ω.
2. FOR PNP TR6 AND TR7
   A. CONNECT A JUMPER WIRE BETWEEN POINTS B & C } SEE PHANTOM WIRING DIAGRAM
   B. R18 MUST BE SOLDERED IN CIRCUIT BETWEEN A & D }
   C. R16 MUST BE 1500Ω.
   D. R17 MUST BE 100Ω THERMISTOR.
3. T1583 (PHILCO) TRANSISTOR BASE LEAD MUST BE SOLDERED INTO B2 AS SHOWN ON PHANTOM WIRING DIAGRAM. BASE LEAD OF ALL OTHER RECOMMENDED TRANSISTORS FOR TR5 MUST BE SOLDERED INTO B1.
5. UNLESS OTHERWISE NOTED— CAPACITORS MORE THAN 1 = MMF CAPACITORS LESS THAN 1 = MF RESISTORS ARE 1/2 WATT K = 1000
6. VOLTAGES ARE POSITIVE WITH RESPECT TO GROUND UNDER NO SIGNAL CONDITIONS.
7. VOLTAGES SHOWN IN ☐ ARE WITH TR6 & TR7 PNP.

GENERAL ELECTRIC MODELS
P785A, P786A, P787A

Schematic Diagram Courtesy of General Electric Co.